



Final

**Summary Report for Group IV Potential
Release Locations,
Environmental Baseline Survey**

**FORMER MARINE CORPS AIR STATION
EL TORO, CALIFORNIA**

July 2008

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**Base Realignment and Closure
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ACRONYMS AND ABBREVIATIONS

BRAC	Base Realignment and Closure
Cal-modified	California-modified
CFR	Code of Federal Regulations
COPC	constituent of potential concern
DON	Department of the Navy
EBS	environmental baseline survey
EPA	Environmental Protection Agency
EPC	exposure point concentration
HI	hazard index
HQ	hazard quotient
MCAS	Marine Corps Air Station
NAVFAC SW	Naval Facilities Engineering Command Southwest
PAH	polynuclear aromatic hydrocarbon
pH	negative logarithm of hydrogen ion concentration
PRG	preliminary remediation goal
PRL	potential release location
RCRA	Resource Conservation and Recovery Act
RIA	Runways Infield Area
SI	site inspection
SRU	silver recovery unit
SVOC	semivolatile organic compound
TCLP	toxicity characteristic leaching procedure
THQ	target hazard quotient
TPH	total petroleum hydrocarbons
TCR	target cancer risk
VOC	volatile organic compound
§	section

1. Introduction

This summary report presents the results of environmental investigations conducted at 6 potential release locations (PRLs) at former Marine Corps Air Station (MCAS) El Toro, California. These investigations included review of available records, visual site inspections, and soil sampling. Based on the results of these investigations, this report provides an evaluation of environmental conditions and indicates whether significant releases of hazardous substances have occurred into the environment at these PRLs.

The environmental investigations of PRLs were initiated by the Department of the Navy's (DON's) Naval Facilities Engineering Command Southwest (NAVFAC SW) as authorized by regulators in a meeting held on 29 September 2004 at former MCAS El Toro. During this meeting, the regulators authorized the DON to prepare investigation plans and perform field investigations of the PRLs at former MCAS El Toro without their prior approval. The main purpose of this was to expedite the assessment of the PRLs. The DON is responsible for evaluating each PRL, preparing the most appropriate sampling plan, assessing whether a significant release of hazardous substances has occurred, conducting site investigations, and submitting final summary reports with conclusions and recommendations to the regulators.

The investigations reported in this document are substantially equivalent to the preliminary assessment pursuant to the National Oil and Hazardous Substances Contingency Plan in Title 40 Code of Federal Regulations (CFR), Section (§) 300.410 (a) and (c), and 40 CFR § 300.420 (a) and (b). The investigations are also substantially equivalent to the investigations of real property pursuant to Community Environmental Response Facilitation Act, Public Law 102-425, 19 October 1992, as it amends Section 120(h) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980.

This document was prepared for the Base Realignment and Closure (BRAC), Program Management Office West and the NAVFAC SW as authorized by the United States Navy, Naval Facilities Engineering Command, Pacific under contract task order No. 0068 of the Comprehensive Long-Term Environmental Action Navy II program, contract number N62742-94-D-0048.

2. Background

2.1 MCAS EL TORO BACKGROUND

Former MCAS El Toro is located in south-central Orange County, California, approximately 8 miles southeast of Santa Ana and 12 miles northeast of Laguna Beach (Figure 1). Former MCAS El Toro covers approximately 4,738 acres. Land use around former MCAS El Toro includes commercial, light industrial, agricultural, and residential. MCAS El Toro closed on 2 July 1999, as a part of the BRAC.

2.2 PRL INVESTIGATION BACKGROUND

During the 2003 environmental baseline survey (EBS), 76 facilities/features were identified at former MCAS El Toro as being associated with a potential release of contaminants to the environment (NAVFAC SW 2003). These facilities or features were assigned PRL designations because of one or more of the following factors:

- Records reported a release of hazardous substances to the environment.
- Observations during the visual site inspection conducted in 2002 indicated a potential release of hazardous substances to the environment.

- Activities undertaken during operation of the station had a high probability of releasing hazardous substances to the environment.

The sites identified were designated as "PRL," followed by the associated building number or feature (e.g., 296, Rail Road, etc.). These PRLs had not been identified during previous investigations or surveys, with the exception of those associated with former silver recovery units (SRUs); PRL 46 (SRU 03A), PRL 133 (SRU 03B), PRL 312 (SRU 03), PRL 439 (SRU 010), PRL 457, and PRL 634. These PRLs were previously identified as SRU locations of concern and were considered for further evaluation as PRLs to assess potential releases at these former SRU facilities.

Twenty-three of the 76 PRLs were investigated in 2003, and one PRL (PRL 400) was investigated in February 2004. The results of the 2003 investigations are presented in the final EBS (NAVFAC SW 2003), and the results for the 2004 investigation are presented in a draft technical memorandum (Earth Tech 2004a). Of those investigated, 17 PRLs (PRL 130, PRL 165, PRL 347, PRL 350, PRL 376, PRL 392, PRL 400, PRL 443, PRL 447, PRL 458, PRL 463, PRL 475, PRL 626, PRL 632, PRL 636, PRL 651, and PRL Pesticides Mixing Area) were found to have no significant release and the regulatory agencies concurred that no further investigation was required.

The remaining 59 PRLs are being addressed in four groups. The assessment of Group I, comprising 16 PRLs (PRL 22, PRL 47, PRL 105, PRL 114, PRL 118, PRL 245/246, PRL 374, PRL 442, PRL 617/618, PRL 658, PRL 671/672, PRL 673, PRL 886/887, PRL 1585, PRL 1601, and PRL Runways Infield Area [RIA]) was conducted in October 2004, and the results of the investigations were presented in a Summary Report (Earth Tech 2005a). The assessment of Group II, comprising 5 PRLs (PRL 51, PRL 310, PRL 370, PRL 445, and PRL 923) was conducted in January 2005, and the results of the investigations were presented in a Summary Report (Earth Tech 2005b). The assessment of Group III, comprising 14 PRLs (PRL 295, PRL 296, PRL 297, PRL 315, PRL 324, PRL 326, PRL 369, PRL 380, PRL 390, PRL 605, PRL 606, PRL 643, PRL 655, and PRL Rail Road) was conducted in April and May 2005, and the results of the investigations were presented in a Summary Report (Earth Tech 2005c). Reports for Groups I, II, and III have been submitted to regulatory agencies for review. With the exception of PRL RIA in Group I and PRLs 296, 297, 605, and 606 in Group III, regulatory agencies concurred with the no further investigation recommendation.

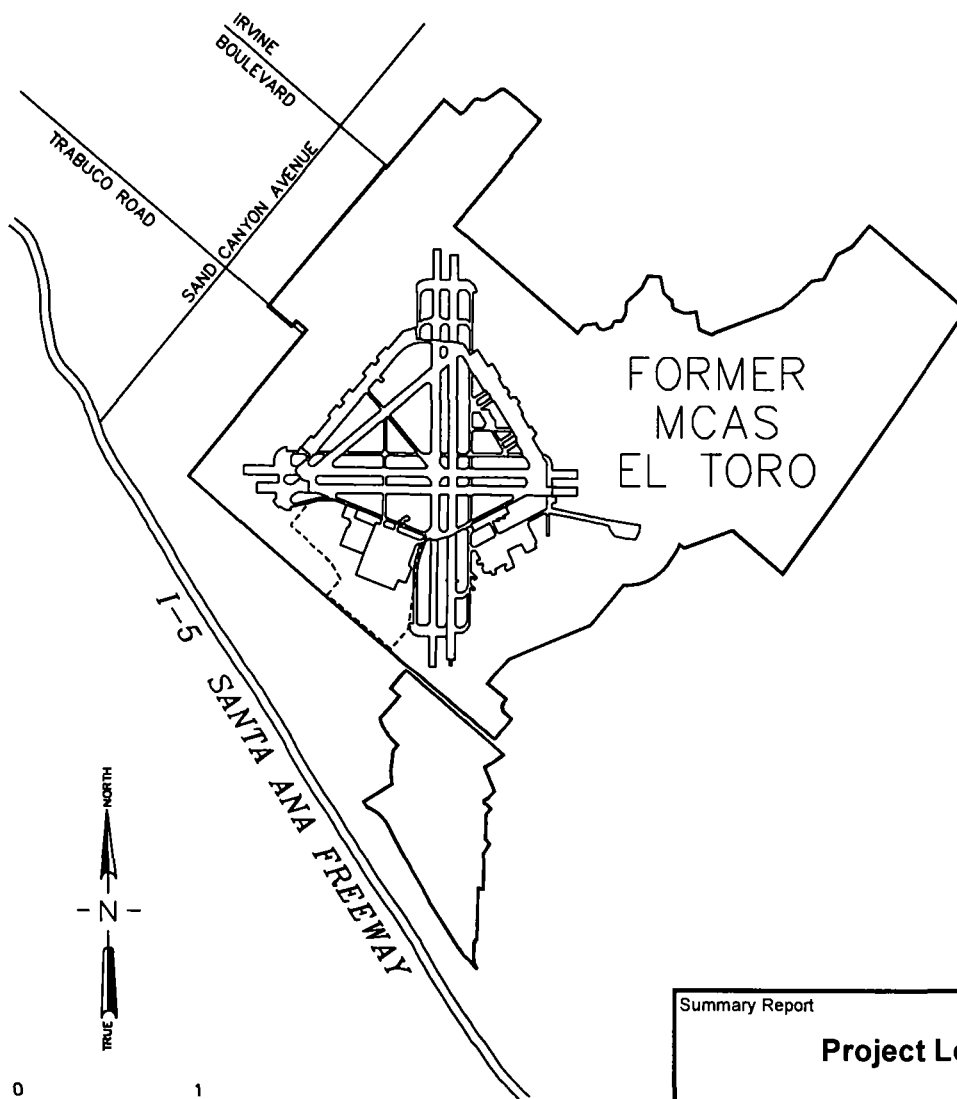
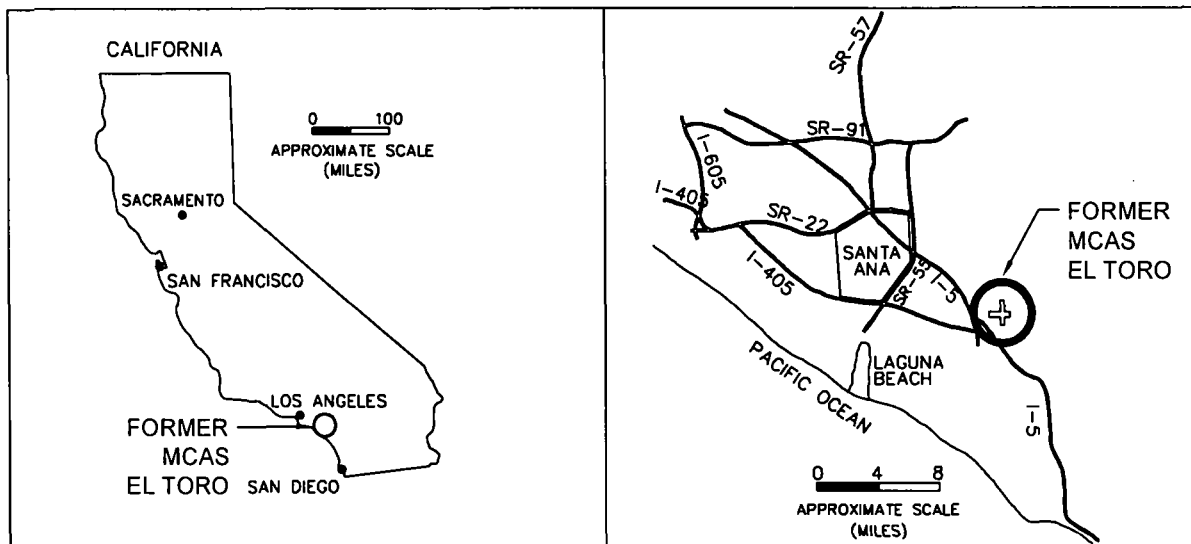
Group IV is comprised of 6 SRU PRLs: PRL 46, PRL 133, PRL 312, PRL 439, PRL 457, and PRL 634. The sampling for Group IV of the PRLs was conducted from January 2003 through June 2005, and the results of the investigations are provided in this summary report.

The investigation results for Groups V PRLs (12 PRLs: PRL 235, PRL 298, PRL 299, PRL 359, PRL 360, PRL 368, PRL 372, PRL 386, PRL 716, PRL 745, PRL 747, and PRL Site 7 Unit 1) will be presented in a subsequent summary report. The Group VI PRLs (6 PRLs: PRL 296, PRL 297, PRL 354, PRL 605, PRL 606, and PRL RIA) will be investigated pursuant to a Site Inspection (SI) and the results will be presented in a subsequent SI Report. The remaining 5 PRLs (PRL 127, PRL 154, PRL 388, PRL 435, and PRL 800) will be addressed under the compliance program.

3. Investigation Methodology

For each Group IV PRL, records review, visual site inspections, and/or soil sampling were conducted to evaluate whether a release of hazardous substances or pollutants into the environment has occurred. The purpose of the records review and visual site inspection was to identify environmentally significant issues. If any environmentally significant issue was identified, soil sampling for further assessment of the release was performed. If an environmentally significant issue

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Summary Report

Project Location Map

Environmental Baseline Survey

Date 07-08

Former MCAS El Toro

Project No.
29307

EarthTech

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Figure
1

was not identified, no further investigation was recommended for the location.

3.1 SAMPLING METHODOLOGY

Once the environmentally significant issues were identified for each PRL, a sampling program was designed to assess whether a significant release of hazardous substances occurred. Sample locations were selected based on the following criteria:

- Where a report or visual evidence of a direct release of hazardous substance to the environment existed, such as stained soil or stressed vegetation, soil samples were collected at that location.
- Where a report or visual evidence of a release existed on concrete or pavement, such as significant staining, etching, or corrosion, soil samples were collected below the bottom of the floor slab or pavement.
- Where past operations involved the use of hazardous substances and the presence of features such as sumps, floor drains, storm drains, cracks, or pits may have resulted in the release of these substances to the environment, soil samples were collected in the vicinity of the features.
- Where evidence of direct releases of hazardous substances containing heavy metals to the sewer via drain pipes existed based on information regarding past activities or operations, samples of the drain pipe contents were collected and/or soil samples were collected beneath or adjacent to the drains. Drain samples were only analyzed for specific metals related to the substances used at the facility.

Table 1 lists the constituents of potential concern (COPCs) recommended for analysis in relation to the issues found at each PRL.

Table 1: Correlation between Issues and Analytes

Issue	COPCs
Batteries/Battery Shop	lead, cadmium, nickel, pH
X-ray/Film Development (SRU)	silver
Printing	VOCs, SVOCs
Painting	VOCs, TPH, lead, cadmium, chromium, cobalt, mercury
Vehicle Wash Rack	VOCs, TPH
Airplane Wash Rack	VOCs, TPH
Dental/Medical Laboratory	copper, mercury, silver, tin
Boiler Room	chromium (total), chromium (hexavalent) if chromium (total) exceeds background
Ordnance Shop (Mechanical Shop)	VOCs, TPH
Hydraulic Lifts	TPH
Fueling Area	VOCs, TPH
Plating Processes	VOCs, cadmium, chromium, copper, lead, nickel, mercury, zinc, cyanide, pH

Notes:
COPC constituent of potential concern
pH negative logarithm of hydrogen ion concentration
SRU silver recovery unit
SVOC semivolatile organic compound
TPH total petroleum hydrocarbons
VOC volatile organic compound

3.2 LABORATORY ANALYSIS AND QUALITY ASSURANCE

Laboratory analysis and data validation were performed in accordance with the specifications and requirements of the *Work Plan* (Earth Tech 2002) and subsequent *Sampling and Analysis Plan Amendment No. 1* (Earth Tech 2004b). Laboratories solicited for this project successfully completed evaluation by the Naval Facilities Engineering Service Center. Laboratory performance was further evaluated through data package reviews and oversight by the project chemist.

Data reported in the project report are flagged with the following appropriate qualifiers to indicate the usability:

- J estimated concentration
- N presumptive evidence of the identification of an analyte
- R rejected data (unusable)
- U not detected above laboratory reporting limit

Combinations of qualifiers such as UJ and NJ are possible. Where the validation qualifiers affect the project decision recommendations, the individual PRL reports discuss the issues and the uncertainty or qualifications of the conclusions.

3.3 RISK SCREENING METHODOLOGY

Risk screening was performed for each Group IV PRL to evaluate the risks associated with potential exposures to chemicals identified in the soil at each PRL. The results of this risk screening are presented in the summary reports for individual PRLs provided as attachments to this report.

The approach used for the risk screening consisted essentially of three elements: selection of COPCs, exposure point concentration (EPC) quantification, and risk quantification.

3.3.1 Selection of COPCs

For each PRL, COPCs were identified as the chemicals that were detected in at least one sample and have Environmental Protection Agency (EPA) Region 9 or California-modified (Cal-modified) cancer or noncancer residential preliminary remediation goals (PRGs) (EPA 2004).

3.3.2 EPC Quantification

The maximum detected concentrations of COPCs were used as EPCs (maximum EPCs) for risk screening.

3.3.3 Risk Quantification

For each PRL, maximum excess (incremental) cancer risk using maximum EPC and a respective carcinogenic PRG was estimated using the following formula:

$$\text{Excess Cancer Risk} = \text{TCR} \times \frac{\text{EPC}_i}{\text{PRG}_i}$$

where:

TCR = target incremental lifetime cancer risk of 10^{-6}

EPC_i = Maximum EPC for $COPC_i$

PRG_i = EPA Region 9 or Cal-modified PRG for $COPC_i$ in soils based on carcinogenic effects

A Hazard Quotient (HQ), using EPC and noncarcinogenic PRG, was calculated using the following formula:

$$HQ = THQ \times \frac{EPC_i}{PRG_i}$$

where:

THQ = target HQ of 1

PRG_i = EPA Region 9 or Cal-modified PRG for $COPC_i$ in soils based on noncarcinogenic effects

The cumulative residential excess cancer risk for exposure to multiple COPCs at a PRL was estimated using the following equation:

$$\text{Cumulative Excess Cancer Risk} = \sum \left[TCR \times \frac{EPC_i}{PRG_i} \right]$$

The cumulative noncarcinogenic hazard index (HI) for exposure to multiple COPCs at a PRL was estimated as follows:

$$\text{Cumulative Noncarcinogenic HI} = \sum \left[THQ \times \frac{EPC_i}{PRG_i} \right]$$

4. Investigation Results and Recommendations

The investigation results, conclusions, and recommendations for all Group IV PRLs are presented in summary reports provided as attachments to this report. The attachments are organized as follows:

- Attachment 1: Summary Report – PRL 46
- Attachment 2: Summary Report – PRL 133
- Attachment 3: Summary Report – PRL 312
- Attachment 4: Summary Report – PRL 439
- Attachment 5: Summary Report – PRL 457
- Attachment 6: Summary Report – PRL 634

Table 2 presents an assessment summary and conclusions for the Group IV PRLs.

Table 2: Evaluation Summary - Group IV PRLs

PRL	Background	Issues and Concerns	Sampling and Analysis Summary	Investigation Results	Recommendations
46	<p>PRL 46 is associated with Building 46 located in the northwest quadrant of former MCAS El Toro, California. The building was identified as Administrative Offices in the 1948 and 1949 Station lists; a Photo Lab in the 1950 list; Administrative Offices in the 1954 list; a Training Building (Clerical School) in the 1958 list; and a Printing Plant in the 1973 list. The last known description was a Reproduction Building in the 1997 list.</p> <p>In a letter dated 29 March 2002, the DTSC recommended further investigation at the site to evaluate the potential for releases of VOCs, SVOCs, metals, cyanide, and pH, at points where piping penetrates the slab and where sub-slab plumbing bends sharply.</p> <p>Soil sampling was conducted for PRL 46 in 2003 at five borehole locations at depths ranging from 2 feet to 2.5 feet bgs. The samples were analyzed for VOCs, SVOCs, PAHs, cyanide, pH, and metals. Benzo(a)pyrene was reported at a concentration of 72 µg/kg in the soil sample from Borehole HA5, collected at a depth of 1 foot to 2 feet bgs adjacent to the floor drain in the restroom in the southwest corner of the building, which is greater than its residential PRG of 62 µg/kg.</p>	<p>In a letter dated 11 April 2003, the EPA recommended providing further rationale for "no further action" at PRL 46 due to the presence of benzo(a)pyrene at a concentration of 72 µg/kg, which was above the residential soil PRG of 62 µg/kg, and other constituents at HA5.</p> <p>In a letter dated 11 April 2003, the DTSC recommended additional assessment in the vicinity of HA5 to determine the extent of PAH contamination. The DTSC also recommended that results of the drain samples should be considered in the strategy for the additional assessment to help identify target compounds.</p>	<p>Soil Sampling. Additional sampling of PRL 46 was conducted in May 2005. One soil sample was collected at location HA6, near the floor drain located in the restroom to assess the vertical extent of benzo(a)pyrene at HA5 where a previous detection above the residential PRG had been reported. The sample at HA6 was collected at a depth of approximately 4 feet bgs, and was analyzed for PAHs.</p> <p>Two additional soil samples (HA7 and HA8) were collected to assess the extent of PAHs in the vicinity of HA5 at depths of 0.5 feet bgs (shallow soil sample) and 4 feet bgs (deep soil sample).</p>	<p>Soil Sampling. None of the soil samples collected in the vicinity of location HA5 contained PAH concentrations exceeding their residential PRGs. These results indicate that the benzo(a)pyrene detected at location HA5 in 2003 is not indicative of a significant release.</p> <p>The cumulative cancer risk at PRL 46 is less than the Station background risk. Additionally, the noncancer hazard at this PRL is less than the background noncancer hazard.</p>	No Further Investigation
			<p>Drain Sampling. Two solid samples of drainpipe contents (DS1 and DS2) and one liquid sample (DS1) were also collected and analyzed for metals.</p>	<p>Drain Sampling. The suite of constituents analyzed in soil were inclusive of the constituents in the drain. The results were compared to State and Federal waste characterization thresholds, and should be taken into consideration during the removal of the drain residuals. It is recommended that the drain material be removed and disposed in accordance with State and Federal regulations under DON guidance as part of housekeeping.</p>	
133	<p>PRL 133 is associated with Building 133, situated in the northeast quadrant of former MCAS El Toro, California. Building 133 was built as a Photographic Lab in 1943. The building was listed as a Photographic Lab in the 1948, 1949, 1950, and 1954 Station lists. The facility description was a Tactical Photo Lab in the 1958 list; a Location Exchange in the 1973 list; and an Office/Training Facility in the 1997 list, which was the last known description.</p> <p>Investigations were initiated at Building 133 in April 2000 and March 2001 that included an inspection of the exterior of the building, a geophysical survey to locate sewer lines, potholing/trenching to expose and inspect sewer lines, and collection of a soil sample for analyses (NAVFAC SW 2002).</p>	<p>In a letter dated 8 April 2002, the DTSC requested additional investigation to evaluate the potential for releases of VOCs, metals, acids (measured by pH), cyanide, and SVOCs. Points to be investigated included where plumbing currently (and formerly) penetrates the slab; below the hand sink discharge to the storm drain; beneath the storm drain; and at sharp bends in sub-slab plumbing.</p> <p>The former use of the building as a photograph processing laboratory may have involved the use and discharge of photographic process chemicals and dissolved metals (i.e., silver from the SRU). Other processes conducted in the building may have resulted in discharges of paint, solvents, paint removers, rust removers, and reproduction chemicals. Further investigation was recommended.</p>	<p>Soil Sampling. Soil sampling to evaluate PRL 133 was conducted in January and February 2003. Soil samples were collected at two locations at PRL 133 at depths ranging from 1-foot to 3.5 feet bgs, and analyzed for VOCs, SVOCs, metals, cyanide, and pH.</p>	<p>Soil Sampling. The reported concentrations of all COPCs were less than their residential PRGs and former MCAS El Toro background values, and are not indicative of a release. The resulting cumulative cancer risk at PRL 133 is less than the Station background risk, and the noncancer hazard at this PRL is less than the background noncancer hazard.</p>	No Further Investigation
			<p>Drain Sampling. Two liquid drain samples (DS1 and DS2) were also collected and analyzed for metals.</p>	<p>Drain Sampling. The suite of constituents analyzed in soil were inclusive of the constituents in the drain. The results were compared to State and Federal waste characterization thresholds, and should be taken into consideration during the removal of the drain residuals. It is recommended that the drain material be removed and disposed in accordance with State and Federal regulations under DON guidance as part of housekeeping.</p>	
312	<p>PRL 312 is associated with Building 312, located in the southwest quadrant of former MCAS El Toro, California. The building was listed as a Photo Laboratory in the 1948, 1949, 1950, and 1954 Station lists; and as the Station Photo Laboratory in the 1958 list. The facility description was a Photographic Building in the 1973 and 1997 Station lists and this was the last known description.</p> <p>A Technical Memorandum was prepared by the DON (NAVFAC SW 1998) that presented a sampling strategy to ascertain whether a release of chemicals of potential concern associated with photographic processing activities at the site had occurred. The chemicals of concern identified in the Technical Memorandum included silver, iron, copper, hydroquinone, glycols, ethylene diethyl, organic nitrogen compounds, ammonia, and cyanides. However, there are no records that an investigation took place.</p>	<p>Chemicals of concern from photographic processing activities may have been released to the environment via the floor drains and sewer lines. Further investigation was recommended.</p>	<p>Soil Sampling. Sampling to evaluate PRL 312 was conducted in June 2005. Nine soil samples were collected at locations HA1 through HA9, to assess for releases of chemicals of concern associated with photographic processes via the floor drains and industrial (acid) waste line connections. The samples were collected 1 foot below the sewer inverts and analyzed for the following photographic operations-related substances: silver, copper, hydroquinone, and cyanides. These analytes were selected from the list presented in the 1998 Technical Memorandum (NAVFAC SW 1998) as those that would most likely indicate if a release has occurred (i.e., those that have lower PRGs would likely have been released in larger quantities, and would have been less likely to breakdown or degrade over time).</p>	<p>Soil Sampling. The reported concentrations of all COPCs were less than their residential PRGs, and are not indicative of a significant release. Additionally, the noncancer hazard at this PRL is less than the target HI of 1.</p>	No Further Investigation
439	<p>PRL 439 is associated with Building 439, situated in the northwest quadrant of former MCAS El Toro, California. Building 439 was listed as a Station Hospital in the 1958 Station list and as a Dispensary and Dental Clinic in the 1973 list. The last known description was Dental Clinic in the 1997 list.</p>	<p>An x-ray room and film developing laboratory were identified during the 2003 EBS. SRU 01, a former silver recovery unit (SRU), was in operation at Building 439 until 1999. The presence of a film processing laboratory may have led to the release of photographic process chemicals and dissolved metals (i.e., silver from the SRU). Further investigation was recommended.</p> <p>The use of the facility as a hospital and dental clinic may have involved the use of thermometers and dental amalgam that may have resulted in discharges of mercury, silver, and other chemicals via sink or floor drains. The facility also contained an analytical laboratory and a sink with a biohazardous waste trap. Further investigation was recommended to assess whether hazardous substances were released into the environment via the building's plumbing system.</p>	<p>Soil Sampling. Sampling to evaluate PRL 439 was conducted in January and February 2003. Six soil samples (including a duplicate) were collected from four locations at depths ranging from 1-foot to 5.5 feet bgs. The soil samples were analyzed for VOCs, SVOCs, metals, cyanide, and pH.</p>	<p>Soil Sampling. The reported concentrations of all COPCs were less than their residential PRGs (except arsenic), and are not indicative of a significant release. Arsenic was detected at a maximum concentration of 4.0 mg/kg, which is greater than the California-modified residential PRG value of 0.06 mg/kg but less than the former MCAS El Toro background value of 6.86 mg/kg. The resulting cumulative cancer risk and the noncancer hazard at PRL 439 is less than the background risk and background noncancer hazard, respectively.</p>	No Further Investigation
			<p>Drain Sampling. Solid (DS3, DS4, and DS6) and liquid samples (DS1, DS2, DS5, and DS7) were also collected from seven sink p-traps at locations DS1 through DS7 and analyzed for metals.</p>	<p>Drain Sampling. The suite of constituents analyzed in soil were inclusive of the constituents in the drain. The results were compared to State and Federal waste characterization thresholds, and should be taken into consideration during the removal of the drain residuals. It is recommended that the p-trap material be removed and disposed in accordance with State and Federal regulations under DON guidance as part of housekeeping.</p>	
457	<p>PRL 457 is associated with Building 457, located in the southeast quadrant of former MCAS El Toro, California. The building was listed as an Administrative Office in the 1973 Station list and as a Barber Shop in the 1997 list. The last known description was a Barber Shop; a Branch Dental Clinic; an Enlisted Mess Hall; and Group Headquarters. An X-ray developing laboratory and dental exam rooms were observed during the visual site inspection conducted in support of the 2003 EBS (NAVFAC SW 2003).</p>	<p>Due to the past use of the facility as a dental/medical clinic, X-ray/photographic development chemicals, dental amalgam, or mercury from thermometers may have been released to the sanitary sewer and the environment via the sink drains and the SRU. Further evaluation was recommended to assess whether releases of pollutants into the environment have occurred as a result of past operations at this facility.</p>	<p>Soil Sampling. Sampling to evaluate PRL 457 was conducted in May 2005. Two samples were collected at a depth of 3 feet bgs and analyzed for copper, mercury, silver, and tin.</p>	<p>Soil Sampling. The reported concentrations of all COPCs were less than their residential PRGs and former MCAS El Toro background values, and are not indicative of a release. Additionally, the noncancer hazard at this PRL is less than the target HI of 1.</p>	No Further Investigation

Table 2: Evaluation Summary - Group IV PRLs

PRL	Background	Issues and Concerns	Sampling and Analysis Summary	Investigation Results	Recommendations
634	PRL 634 is associated with Building 634, situated in the northeast quadrant of former MCAS El Toro, California. The building was identified as a Maintenance Hanger; an Airframes Shop; and an Avionics Shop in 1973.	Floor drains and service sinks were identified throughout the facility, as well as floor drains in the Cleaning and Plating Shop, and a SRU in the X-Ray Processing and Control Room, which could have served as routes of release of hazardous chemicals used in the shops. Further investigation was recommended.	Soil Sampling. Sampling to evaluate PRL 634 was conducted in January and March 2003. Seven soil samples were collected from seven borehole locations at depths ranging from 0.5-foot to 2 feet bgs, and analyzed for VOCs, SVOCs, TPH, and metals.	Soil Sampling. The reported concentrations of all COPCs are within the former MCAS El Toro background range and were less than their residential PRGs (except arsenic and iron), and are not indicative of a release. Arsenic was detected at a concentration of 7.8 mg/kg at location HA1, which is greater than its California-modified residential PRG value of 0.06 mg/kg and former MCAS El Toro statistically derived background value of 6.86 mg/kg (which is based on the 95 th quantile). However, it is within the range of arsenic concentrations used to derive the background (BNI 1996) and is less than the maximum reported concentration of 8.5 mg/kg. This data suggests that this value is within the expected range of arsenic concentrations at the Station. Iron was detected at a concentration of 32,100 mg/kg at location HA1, which is greater than the former MCAS El Toro background concentration of 18,400 mg/kg and the PRG concentration of 23,463 mg/kg. However, iron is not identified as a COPC at this location and all other soil samples collected at a similar depth were consistent with background concentrations. The soil sample from location HA1 was collected next to a cast iron sewer pipe and may have contained remnants of the pipe material. Magnesium and potassium were detected at concentrations greater than the former MCAS El Toro background values at location HA1; no PRGs exist for these metals. Therefore, the results from HA1 and in particular iron are assessed to be an anomaly. The other samples collected at this site were consistent with background indicating these concentrations are localized at HA1 and are not indicative of a release. Therefore, the reported concentrations of all COPCs at PRL 634 are not indicative of a release. The resulting cumulative cancer risk and the noncancer hazard at PRL 634 are consistent with the background cancer risk and background noncancer hazard, respectively.	No Further Investigation
			Drain Sampling. A sediment sample (DS1) was also collected and analyzed for metals.	Drain Sampling. The suite of constituents analyzed in soil were inclusive of the constituents in the drain. The results were compared to State and Federal waste characterization thresholds, and should be taken into consideration during the removal of the drain residuals. It is recommended that the sink drain material be removed and disposed in accordance with State and Federal regulations under DON guidance as part of housekeeping.	

5. References

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Attachment 1
Summary Report
PRL 46



Summary Report for PRL 46, Environmental Baseline Survey

FORMER MARINE CORPS AIR STATION EL TORO, CALIFORNIA

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Prepared for:

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ACRONYMS AND ABBREVIATIONS

µg/kg	micrograms per kilogram
µg/L	micrograms per liter
B(a)P	benzo(a)pyrene
bgs	below ground surface
BNI	Bechtel National, Inc.
COPC	constituent of potential concern
DON	Department of the Navy
DTSC	Department of Toxic Substances Control
EBS	environmental baseline survey
EPA	Environmental Protection Agency
EPC	exposure point concentration
HA	hand auger
HI	hazard index
ID	identification
J	indicates an estimated value
LOC	location of concern
MCAS	Marine Corps Air Station
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NA	not analyzed
NAVFAC SW	Naval Facilities Engineering Command Southwest
PAH	polynuclear aromatic hydrocarbon
PEF	potency equivalency factor
PNI	Phillips National, Inc.
PRG	preliminary remediation goal
pH	negative logarithm of hydrogen ion concentration
PRL	potential release location
SIM	selective ion monitoring
SRU	silver recovery unit
SVOC	semivolatile organic compound
U	indicates the compound or analyte was analyzed for but was not detected at or above the stated limit
UJ	indicates the compound or analyte was analyzed for but was not detected; the sample detection limit is an estimated value
UST	underground storage tank
VOC	volatile organic compound

1. Background

Potential Release Location (PRL) 46 is associated with Building 46 located in the northwest quadrant of former Marine Corps Air Station (MCAS) El Toro, California (Figure 1). The building was identified as Administrative Offices in the 1948 and 1949 Station lists; a Photo Lab in the 1950 list; Administrative Offices in the 1954 list; a Training Building (Clerical School) in the 1958 list; and a Printing Plant in the 1973 list. The last known description was a Reproduction Building in the 1997 list. Figure 2 shows the plan of Building 46 and the surrounding area.

Two locations of concern (LOCs) were associated with this site. UST 46 was a 500-gallon diesel underground storage tank (UST) that was removed (Phillips National, Inc. [PNI] 1992) and the site closed by the Orange County Health Care Agency in a letter dated 12 November 1996. SRU 3A was identified as a former silver recovery unit (SRU) associated with the photography laboratory. Soil samples were collected in April 2000 to assess whether releases of hazardous substances have occurred to the subsurface soils adjacent to the sanitary sewer pipeline to which the SRU discharged. No evidence of significant releases to the subsurface soils was identified based on the sampling results and historical information (Naval Facilities Engineering Command Southwest [NAVFAC SW] 2001). Previous sampling was conducted to investigate LOCs UST46 and SRU 3A. However, these previous investigations did not coincide with or affect the scope of the PRL investigation which focused on evaluating releases in the immediate vicinity of drains associated with photography laboratory and areas where staining was observed during visual site inspections.

In a letter dated 29 March 2002, Department of Toxic Substances Control (DTSC) recommended further investigation at the site to evaluate the potential for releases of volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), metals, cyanide, and negative logarithm of hydrogen ion concentration (pH), at points where piping penetrates the slab and where sub-slab plumbing bends sharply.

Based on the review of available documentation, including similar activities at other Department of Defense installations, and in concurrence with the regulatory agencies, soil sampling was conducted at PRL 46 in 2003. Soil samples were collected from five boreholes: HA1, HA2, HA3, HA4, and HA5 at depths of 2 feet, 2.5 feet, 2.5 feet, 2.5 feet, and 2 feet below ground surface (bgs), respectively. The samples were analyzed for VOCs, SVOCs, polynuclear aromatic hydrocarbons (PAHs), cyanide, pH, and metals. The analytical results for these soil samples are presented in Table 2. The soil sample locations are shown on Figure 2.

Benzo(a)pyrene was reported at a concentration of 72 µg/kg in the soil sample from Borehole HA5, collected at a depth of 1 feet to 2 feet bgs adjacent to the floor drain in the restroom in the southwest corner of the building, which is greater than its residential preliminary remediation goal (PRG) of 62 micrograms per kilogram (µg/kg). SVOCs and cyanide were not detected above the laboratory reporting limits. None of the VOCs and metals exceeded their respective residential PRGs (except arsenic), although a few metal exceedances above the former MCAS El Toro background values (Bechtel National, Inc. [BNI] 1996) were observed. Arsenic was detected at a maximum concentration of 4.7 milligrams per kilogram (mg/kg) at location HA1, which is greater than the California-modified residential PRG value of 0.06 mg/kg but less than the former MCAS El Toro background value of 6.86 mg/kg.

In addition, to evaluate constituents in the floor drains, two solid samples (DS1 and DS2) and one liquid sample (DS1) were also collected and analyzed for metals. The analytical results for these floor drain samples are presented in Appendix A, and in the Environmental Baseline Survey (EBS) (NAVFAC SW 2003). The results were compared to Federal and State waste characterization

thresholds. This data should be taken into consideration during the proposed removal of the residuals in the drains.

2. Issues and Concerns

The following issues and concerns associated with this PRL were identified through the records review, previous investigations, and visual site inspections conducted in 2002 in support of the 2003 EBS (NAVFAC SW 2003), and in 2004 as part of supplemental site reconnaissance:

- In a letter dated 11 April 2003, the Environmental Protection Agency (EPA) recommended providing further rationale for "no further action" at PRL 46 due to the presence of benzo(a)pyrene above the residential soil PRG, and other constituents at HA5.
- In a letter dated 11 April 2003, the DTSC recommended additional assessment in the vicinity of HA5 to determine the extent of PAH contamination. The DTSC also recommended that results of the drain samples should be considered in the strategy for the additional assessment to help identify target compounds.

A sampling program was proposed to further investigate the issues identified and assess whether a release to the environment of hazardous substances or pollutants has occurred. A summary of soil sampling activities is presented in Section 3, and the results are presented in Section 4.

3. Sampling and Analysis Summary

Sampling to evaluate PRL 46 was conducted in May 2005. The sample locations are shown on Figure 2, and a summary of sampling and analyses is provided in Table 1.

One soil sample was collected at location HA6, near the floor drain located in the restroom to assess the vertical extent of benzo(a)pyrene at HA5 where a previous detection above the residential PRG had been reported. The sample at HA6 was collected at a depth of approximately 4 feet bgs using hand auger (HA) equipment. The soil sample was analyzed for PAHs.

Two additional soil samples (HA7 and HA8) were collected to assess the extent of PAHs in the vicinity of HA5. The samples were collected from two locations: HA7 and HA8. At each location, the samples were collected at two depths, 0.5 feet bgs (shallow soil sample) and 4 feet bgs (deep soil sample) using HA equipment, and analyzed for PAHs.

4. Investigation Results

This section presents analytical results and discusses the results of data evaluation and risk screening.

4.1 ANALYTICAL RESULTS AND QUALITY ASSURANCE

The analytical results for the samples collected at PRL 46 along with the United States EPA Region 9 or California-modified PRGs are presented in Table 2 (EPA 2004a). Appendix B presents the validated laboratory analytical data and Appendix C presents the land surveying data.

Some results were qualified as estimated in the data validation process. These validation qualifiers do not affect the findings or conclusions of this report.

4.2 RESULTS EVALUATION AND RISK SCREENING

None of the additional soil samples collected in the vicinity of location HA5 contained PAH concentrations exceeding their residential PRGs. These results indicate that the benzo(a)pyrene reported at location HA5 in 2003 was highly localized and was not indicative of a significant release. In addition, an evaluation of the soil sample results point out the high metal concentrations reported in the drain samples were not replicated in the soil and indicate that a significant release to the environment has not occurred.

Risk screening was performed to evaluate risks associated with potential exposures to detected analytes in the soil at PRL 46. The methodology for risk screening is presented in Section 3.3 of the main text of the Summary Report, and results are presented in Table 3. As part of the risk estimation, the benzo(a)pyrene equivalent concentration was calculated for the samples collected at PRL 46, using the potency equivalency factors provided in the updated Technical Support Document dated May 2005 (OEHHA 2005). This benzo(a)pyrene equivalent concentration was then used to estimate the carcinogenic risk at each of these locations due to PAHs. These calculations are presented in Table 4.

The cumulative (including results from the 2003 and 2005 investigations) maximum carcinogenic risk due to potential exposure to maximum detected concentrations of constituents of potential concern (COPCs) (detected analytes) at PRL 46 is $7.8\text{E-}05$, which is less than the background risk of $1.1\text{E-}04$, and is within the EPA-established risk management range of 10^{-6} to 10^{-4} . The maximum exposure point concentration (EPC) for arsenic (4.7 mg/kg) reported in the surface soil sample at location HA1 during the 2003 investigation accounts for nearly 98 percent of the cancer risk. However, this maximum arsenic EPC is less than the former MCAS El Toro background value of 6.86 mg/kg (BNI 1996). The cumulative maximum noncancer hazard associated with potential exposure to maximum detected concentrations of COPCs, expressed as the hazard index (HI), is 2.3, which is less than the background HI of 2.5. The maximum exposure point concentrations for iron (21,500 mg/kg) and vanadium (47.6 mg/kg) reported in the surface soil sample at location HA2 during the 2003 investigation accounts for nearly 40 percent and 27 percent of the noncancer HI, respectively. However, these maximum iron and vanadium concentrations are both less than their respective residential PRG values and the vanadium concentration is less than the Station background value of 71.8 mg/kg.

5. Conclusions and Recommendations

The primary objective of investigations conducted at PRL 46 was to assess whether a release of hazardous substances or pollutants into the environment has occurred. A review of available records, visual site inspections, and sampling activities were conducted for this assessment. One soil sample collected in 2003 contained benzo(a)pyrene, a PAH, in excess of its residential PRG. Subsequent samples were collected in 2005 to confirm this result and delineate the extent of the PAHs. The reported concentrations of PAHs in all subsequent samples were less than their respective residential PRGs, and are not indicative of a significant release. The cumulative cancer risk for PRL 46 is less than the Station background risk, and is within the EPA established risk management decision range of 10^{-6} to 10^{-4} . Additionally, the noncancer hazard at this PRL is less than the background noncancer hazard. Based on these findings, the impacted soil is assessed not to pose a risk to human health or groundwater, and therefore no further investigation is recommended for PRL 46.

6. References

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Tables

Table 1: Sampling and Analyses Summary – PRL 46

Analytical Group and Method ^a	Sample Location	HA6	HA7	HA7	HA8	HA8
	EPA ID	LJ541	LJ542	LJ543	LJ544	LJ556
	Sample Depth (feet bgs)	4	0.5	4	0.5	4
	Sampling Technique	HA	HA	HA	HA	HA
PAHs 8270-SIM		X	X	X	X	X

Notes:

^a Analysis was in general accordance with the listed methods provided in EPA Publication SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.

bgs = below ground surface

EPA = Environmental Protection Agency

HA = hand auger

ID = identification

PAH = polynuclear aromatic hydrocarbon

PRL = potential release location

SIM = selective ion monitoring

X = analysis was performed for the specified analyte

Table 2: Analytical Results Summary - PRL 46

Analyte	MCAS El Toro	Residential Soil PRG ^b	Sample Location	PRL46-HA1	PRL46-HA2	PRL46-HA3	PRL46-HA4	PRL06-HA5	PRL46- HA6	PRL46-HA7	PRL46-HA7	PRL46-HA8	PRL46-HA8
	Background Value		Sample Depth	1.0-2.0 feet bgs	1.5-2.5 feet bgs	1.0-2.5 feet bgs	1.5-2.5 feet bgs	1.0-2.0 feet bgs	4 feet bgs	0.5 feet bgs	4 feet bgs	0.5 feet bgs	4 feet bgs
	(95th quantile) ^a		EPA ID	LJ103	LJ102	LJ099	LJ101	LJ100	LJ541	LJ542	LJ543	LJ544	LJ556
Volatile Organic Compounds (µg/kg)													
4-Methyl-2-pentanone	—	5.3E+06		54 UJ	58 UJ	55 UJ	49 UJ	0.7 J	NA	NA	NA	NA	NA
Total Xylenes	—	2.7E+05		16 U	17 U	17 U	15 U	0.8 J	NA	NA	NA	NA	NA
Polynuclear Aromatic Hydrocarbons (µg/kg)													
Anthracene	—	2.2E+07		32 U	28 U	28 U	26 U	39	28 U	29 U	29 U	26 U	29 U
Benzo(a)anthracene	—	6.2E+02		32 UJ	28 UJ	28 UJ	26 UJ	70 J	28 U	29 U	29 U	26 U	1 J
Benzo(a)pyrene	—	6.2E+01		32 U	28 U	28 U	26 U	72	28 U	29 U	29 U	28 U	1 J
Benzo(b)fluoranthene	—	6.2E+02		32 U	28 U	28 U	26 U	78	28 U	29 U	29 U	2 J	2 J
Benzo(g,h,i)perylene	—	—		32 U	28 U	28 U	26 U	36	28 U	29 U	29 U	26 U	1 J
Benzo(k)fluoranthene ^c	—	3.8E+02		32 U	28 U	28 U	26 U	59	28 U	29 U	29 U	3 J	0.7 J
Chrysene ^d	—	3.8E+03		32 UJ	28 UJ	28 UJ	26 UJ	86 J	28 U	29 U	29 U	4 J	3 J
Dibenz(a,h)anthracene	—	6.2E+01		32 U	28 U	28 U	26 U	15 J	28 U	29 U	29 U	26 U	29 U
Fluoranthene	—	2.3E+06		32 U	28 U	28 U	26 U	190	28 U	29 U	29 U	1 J	1 J
Indeno(1,2,3-cd)pyrene	—	6.2E+02		32 U	28 U	28 U	26 U	32	28 U	29 U	29 U	26 U	0.8 J
Phenanthrene	—	—		32 UJ	28 UJ	28 UJ	26 UJ	160 J	28 U	29 U	29 U	26 U	29 U
Pyrene	—	2.3E+06		32 U	28 U	28 U	26 U	150	28 U	29 U	29 U	2 J	1 J
Metals (mg/kg)													
Aluminum	14,800	7.6E+04		15,200	18,200	12,400	8,430	18,800	NA	NA	NA	NA	NA
Antimony	3.06	3.1E+01		15 U	13 U	13 U	13 U	15 U	NA	NA	NA	NA	NA
Arsenic	6.86	6.2E-02		4.7 J	4.5 J	2.8	2.1 J	3.6 J	NA	NA	NA	NA	NA
Barium	173	5.4E+03		141	175	131	86.9	165	NA	NA	NA	NA	NA
Beryllium	0.669	1.5E+02		1 U	0.9 U	0.89 U	0.84 U	1 U	NA	NA	NA	NA	NA
Cadmium	2.35	3.7E+01		0.43 UJ	0.47 UJ	0.42 UJ	0.34 UJ	0.61 UJ	NA	NA	NA	NA	NA
Calcium	46,000	—		4,490	6,340	4,800	2,610	6,280	NA	NA	NA	NA	NA
Chromium	26.9	2.1E+02		13.3	16	14.8	7.9	15.9	NA	NA	NA	NA	NA
Cobalt	6.98	9.0E+02		7.2	9.5	6.3	4.3	8.6	NA	NA	NA	NA	NA
Copper	10.5	3.1E+03		8.5	10.3	7	3.7	10.2	NA	NA	NA	NA	NA
Iron	18,400	2.3E+04		18,000 J	21,500 J	15,000 J	10,800 J	21,200 J	NA	NA	NA	NA	NA
Lead ^c	15.1	1.5E+02		5.1	4.5	4.3 J	2.4	6.9	NA	NA	NA	NA	NA
Magnesium	8,370	—		6,860 J	8,550 J	5,720 J	3,570 J	8,590 J	NA	NA	NA	NA	NA
Manganese	291	1.8E+03		276	319	244	194	319	NA	NA	NA	NA	NA
Mercury	0.22	2.3E+01		0.0043	0.016	0.009	0.033	0.015	NA	NA	NA	NA	NA
Nickel	15.3	1.6E+03		8.1	9.9	8.6	4.7	12.1	NA	NA	NA	NA	NA
Potassium	4,890	—		4,080 J	5,010 J	3,380 J	2,390 J	5,090 J	NA	NA	NA	NA	NA
Selenium	0.32	3.9E+02		1.5 U	1.3 U	1.3 U	0.54 UJ	1.5 U	NA	NA	NA	NA	NA
Silver	0.539	3.9E+02		2.5 U	2.2 U	0.27 UJ	2.1 U	2.6 U	NA	NA	NA	NA	NA
Sodium	405	—		510 U	226 UJ	440 U	46.5 UJ	63.4 UJ	NA	NA	NA	NA	NA
Thallium	0.42	5.2E+00		2 U	1.8 U	1.8 U	1.7 U	2.1 U	NA	NA	NA	NA	NA
Vanadium	71.8	7.8E+01		39.2	47.6	33.9	23.9	47.3	NA	NA	NA	NA	NA
Zinc	77.9	2.3E+04		51.9	58.3	45.3	29	58.3	NA	NA	NA	NA	NA

Notes

Concentrations in **bold font** indicate values greater than the residential soil PRGs, but less than the former MCAS El Toro background values.
Concentrations in *italicized and underline font* indicate values greater than the former MCAS El Toro background values, but less than the residential soil PRGs
^a Source: BNI 1996
^b Analytical results were compared to EPA Region 9 PRGs (2004a), with the exception of benzo(k)fluoranthene, chrysene, and lead (see note c)
^c Analytical results for benzo(k)fluoranthene, chrysene, and lead were compared to California-modified PRGs (2004a) because they are significantly more protective than the corresponding EPA Region 9 PRGs
Locations HA6, HA7, and HA8 were sampled during this investigation (2005), and all other locations were sampled during the 2003 investigation
— = value does not exist
µg/kg= micrograms per kilogram
bgs = below ground surface
BNI = Bechtel National, Inc.
EPA = Environmental Protection Agency
ID = identification
J = indicates an estimated value
MCAS = Marine Corps Air Station
mg/kg= milligrams per kilogram
NA = not analyzed
PRG = preliminary remediation goal
PRL = potential release location
U= indicates the compound or analyte was analyzed for but was not detected at or above the stated limit
UJ= indicates the compound or analyte was analyzed for but was not detected; the sample detection limit is an estimated value

Table 3: Risk Screening Results - PRL 46

COPC	Maximum EPC	MCAS El Toro Background Value (95th quantile) ^a	Carcinogenic PRG ^b	Noncarcinogenic PRG ^b	Risk Corresponding to Maximum EPC				Risk Corresponding to Background			
					Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic	
					Excess Cancer Risk ^c	Percent Contribution to Cancer Risk ^d	HI ^e	Percent Contribution to Noncancer Risk ^d	Excess Cancer Risk ^f	Percent Contribution to Cancer Risk ^g	HI ^h	Percent Contribution to Noncancer Risk ^g
Volatile Organic Compounds (µg/kg)												
4-Methyl-2-pentanone	0.7	--	--	5.3E+06	--	--	1.3E-07	0.0%	--	--	--	--
Total Xylenes	0.8	--	--	2.7E+05	--	--	3.0E-06	0.0%	--	--	--	--
Polynuclear Aromatic Hydrocarbons (µg/kg)												
Anthracene	39	--	--	2.2E+04	--	--	1.8E-03	0.1%	--	--	--	--
Benzo(a)anthracene	70	--	6.2E+02	--	1.1E-07	0%	--	--	--	--	--	--
Benzo(a)pyrene	72	--	6.2E+01	--	1.2E-06	1%	--	--	--	--	--	--
Benzo(b)fluoranthene	78	--	6.2E+02	--	1.3E-07	0%	--	--	--	--	--	--
Benzo(g,h,i)perylene	36	--	--	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene ⁱ	59	--	3.8E+02	--	1.6E-07	0%	--	--	--	--	--	--
Chrysene ⁱ	86	--	3.8E+03	--	2.3E-08	0%	--	--	--	--	--	--
Dibenz(a,h)anthracene	15	--	6.2E+01	--	2.4E-07	0%	--	--	--	--	--	--
Fluoranthene	190	--	--	2.3E+06	--	--	8.3E-05	0.0%	--	--	--	--
Indeno(1,2,3-cd)pyrene	32	--	6.2E+02	--	5.1E-08	0%	--	--	--	--	--	--
Phenanthrene	160	--	--	--	--	--	--	--	--	--	--	--
Pyrene	150	--	--	2.3E+06	--	--	6.5E-05	0.0%	--	--	--	--
Metals (mg/kg)												
Aluminum	18,800	14,800	--	7.6E+04	--	--	2.5E-01	10.9%	--	--	1.9E-01	7.6%
Arsenic ⁱ	4.7	6.86	6.2E-02	2.2E+01	7.6E-05	98%	2.2E-01	9.6%	1.1E-04	99.9%	3.2E-01	12.5%
Barium	175	173	--	5.4E+03	--	--	3.3E-02	1.4%	--	--	3.2E-02	1.3%
Calcium	6,340	46,000	--	--	--	--	--	--	--	--	--	--
Chromium	16	26.9	2.1E+02	--	7.6E-08	0%	--	--	1.3E-07	0.1%	--	--
Cobalt	9.5	6.98	9.0E+02	1.4E+03	1.1E-08	0%	6.9E-03	0.3%	7.7E-09	0.0%	5.1E-03	0.2%
Copper	10.3	10.5	--	3.1E+03	--	--	3.3E-03	0.1%	--	--	3.4E-03	0.1%
Iron	21,500	18,400	--	2.3E+04	--	--	9.2E-01	40.3%	--	--	7.8E-01	30.8%
Lead ⁱ	6.9	15.1	--	1.5E+02	--	--	4.6E-02	2.0%	--	--	1.0E-01	4.0%
Magnesium	8,590	8,370	--	--	--	--	--	--	--	--	--	--
Manganese	319	291	--	1.8E+03	--	--	1.8E-01	8.0%	--	--	1.7E-01	6.5%
Mercury	0.033	0.22	--	2.3E+01	--	--	1.4E-03	0.1%	--	--	9.4E-03	0.4%
Nickel	12.1	15.3	--	1.6E+03	--	--	7.7E-03	0.3%	--	--	9.8E-03	0.4%
Potassium	5,090	4,890	--	--	--	--	--	--	--	--	--	--
Vanadium	47.6	71.8	--	7.8E+01	--	--	6.1E-01	26.8%	--	--	9.2E-01	36.1%
Zinc	58.3	77.9	--	2.3E+04	--	--	2.5E-03	0.1%	--	--	3.3E-03	0.1%
Cumulative Maximum Risk					7.8E-05		2.3E+00		1.1E-04		2.5E+00	

Notes:

^a Source: BNI 1996

^b United States EPA Region 9 PRGs (2004a)

^c Excess cancer risk = 1E-06 x (Maximum EPC/Carcinogenic PRG)

^d With respect to cumulative excess cancer risk or hazard index

^e HI = Maximum EPC / Noncarcinogenic PRG

^f Excess cancer risk = 1E-06 x (MCAS El Toro Background Concentration/Carcinogenic PRG)

^g With respect to cumulative excess cancer risk or hazard index

^h HI = MCAS El Toro Background Concentration / Noncarcinogenic PRG

ⁱ = Analytical results for benzo(k)fluoranthene, chrysene, and lead were compared to California-modified PRGs (2004a) because they are significantly more protective than the corresponding EPA Region 9 PRGs

-- = value does not exist

µg/kg= micrograms per kilogram

BNI = Bechtel National, Inc.

COPC = constituent of potential concern

EPA = Environmental Protection Agency

EPC = exposure point concentration

HI = hazard index

MCAS = Marine Corps Air Station

mg/kg= milligrams per kilogram

PRG = preliminary remediation goal

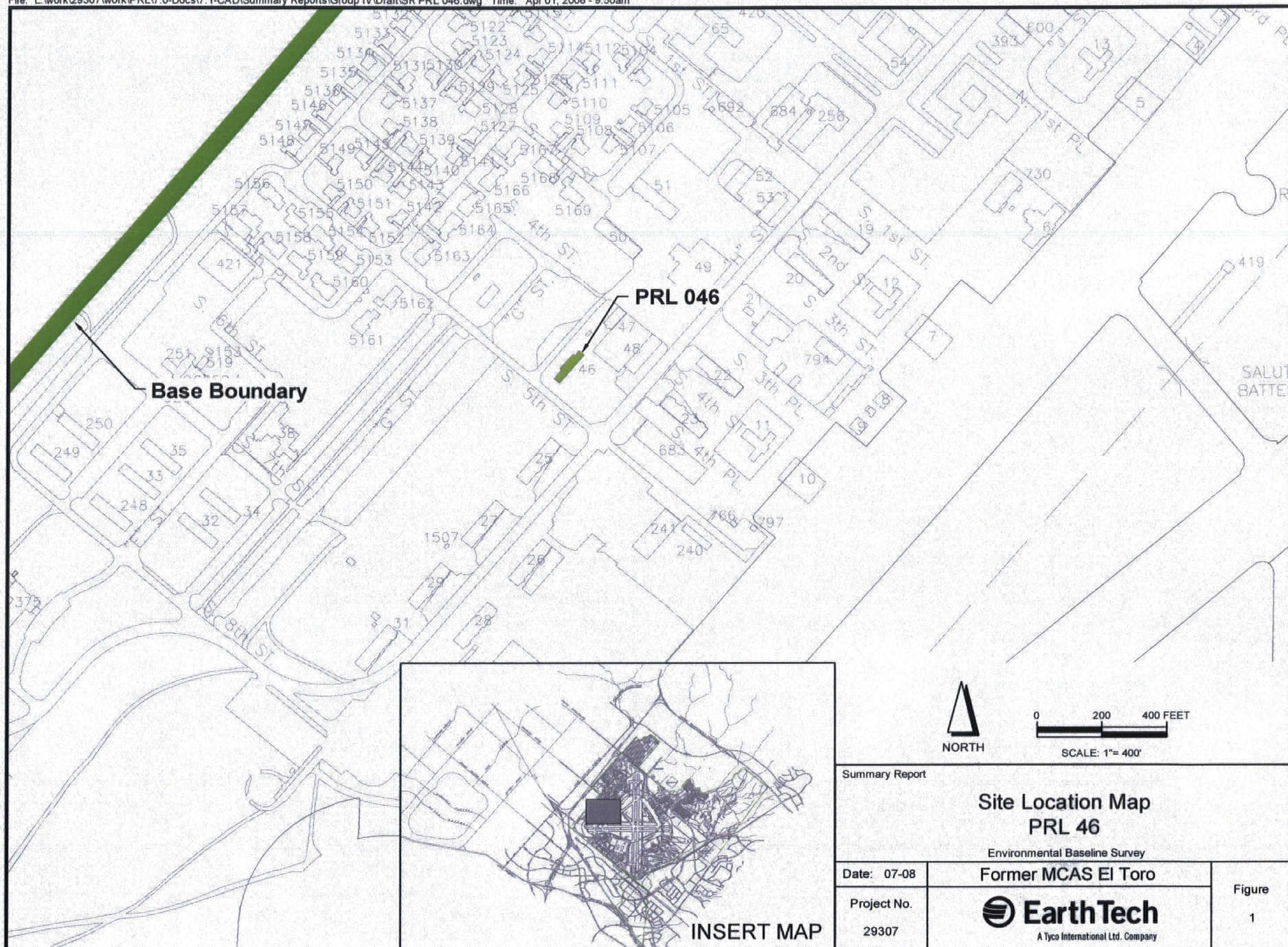
PRL = potential release location

Table 4: Benzo(a)Pyrene Equivalent Calculations - PRL 46

Sample Location	Sample Depth	EPA ID	Benzo(a)pyrene	Benzo(a)pyrene	Benzo(a)anthracene	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(k)fluoranthene	Chrysene	Chrysene	Dibenz(a,h)anthracene	Dibenz(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	Total	Risk
			(µg/kg)	B(a)P Equivalent	(µg/kg)	B(a)P Equivalent	(µg/kg)	B(a)P Equivalent	(µg/kg)	B(a)P Equivalent	(µg/kg)	B(a)P Equivalent	(µg/kg)	B(a)P Equivalent	(µg/kg)	B(a)P Equivalent		
PEF				1		0.1		0.1		0.1		0.01		1.1		0.1		
PRL 46-HA1	1-2 feet bgs	LJ103	16	16	16	1.6	16	1.6	16	1.6	16	0.16	16	17.6	16	1.6	40.16	6.5E-07
PRL 46-HA2	1.5-2.5 feet bgs	LJ102	14	14	14	1.4	14	1.4	14	1.4	14	0.14	14	15.4	14	1.4	35.14	5.7E-07
PRL 46-HA3	1-2.5 feet bgs	LJ099	14	14	14	1.4	14	1.4	14	1.4	14	0.14	14	15.4	14	1.4	35.14	5.7E-07
PRL 46-HA4	1.5-2.5 feet bgs	LJ101	13	13	13	1.3	13	1.3	13	1.3	13	0.13	13	14.3	13	1.3	32.63	5.3E-07
PRL 46-HA5	1-2 feet bgs	LJ100	72	72	70	7	78	7.8	59	5.9	86	0.86	15	16.5	32	3.2	113.26	1.8E-06
PRL 46-HA6	4 feet bgs	LJ541	14	14	14	1.4	14	1.4	14	1.4	14	0.14	14	15.4	14	1.4	35.14	5.7E-07
PRL 46-HA7	0.5 feet bgs	LJ542	14.5	14.5	14.5	1.45	14.5	1.45	14.5	1.45	14.5	0.145	14.5	15.95	14.5	1.45	36.40	5.9E-07
PRL 46-HA7	4 feet bgs	LJ543	14.5	14.5	14.5	1.45	14.5	1.45	14.5	1.45	14.5	0.145	14.5	15.95	14.5	1.45	36.40	5.9E-07
PRL 46-HA8	0.5 feet bgs	LJ544	13	13	13	1.3	2	0.2	3	0.3	4	0.04	13	14.3	13	1.3	30.44	4.9E-07
PRL 46-HA8	4 feet bgs	LJ556	1	1	1	0.1	2	0.2	0.7	0.07	3	0.03	14.5	15.95	0.8	0.08	17.43	2.8E-07

Notes:
Concentrations in italic denote values which were less than the reporting limits; and for the B(a)P calculations their value was divided by 2.
PEFs are based on the updated Technical Support Document dated May 2005 (OEHHA 2005)
The PEF for dibenz(a,h)anthracene was calculated using the ratio of inhalation unit risk for dibenz(a,h)anthracene and benzo(a)pyrene as per the 2005 OEHHA document.
µg/kg =micrograms per kilogram
B(a)P= Benzo(a)pyrene
bgs = below ground surface
EPA = Environmental Protection Agency
ID = identification
MCAS = Marine Corps Air Station
PEF = potency equivalency factor
PRL = potential release location

Figures



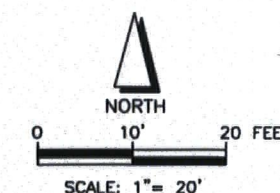


Building Exterior
(Facing South)



LEGEND:

- Existing Infrastructure
- Sewer Line
- Carve-out Boundary
- Sink
- Floor Drain
- Approximate 1991 Soil Sample Location (PNI, 1992)
(Analytes: TPH and BTEX)
- Approximate 2000 Soil Sample Location (NAVFAC SW, 2001)
(Analytes: Metals)
- Approximate 2000 Soil Sample Location (NAVFAC SW, 2001)
(Analytes: VOCs and Metals)
- 2003 Drain Sample Location (NAVFAC SW, 2003)
(Analytes: Metals)
- 2003 Soil Sample Location (NAVFAC SW, 2003)
(Sample Depth: 1 to 2 ft bgs; Analytes: VOCs, SVOCs, PAHs, Metals, pH, and Cyanide)
- HA8 Soil Sample Location (Earth Tech, 2005)
(Sample Depth: 0.5 to 4 ft bgs; Analytes: PAHs)



Note: Features and interior layout are approximate and may not be to scale

Summary Report

**Site Plan
PRL 46**

Environmental Baseline Survey

Date: 07-08

Former MCAS El Toro

Project No.
29307

EarthTech
A Tyco International Ltd. Company

Figure
2

Appendix A
Drain Sampling Results

Table A-1: Analytical Results and Preliminary Waste Characterization, Sink Drain Samples (Solid Matrix), PRL 46

Analyte	RCRA Hazardous Waste		California Hazardous Waste			Sample Location	PRL46-DS1	PRL46-DS2
	TCLP ^a (mg/L)	20 x TCLP ^b (mg/kg)	TTLC ^c (mg/kg)	STLC ^d (mg/L)	10 x STLC ^e (mg/kg)	Sample Depth	Sink Drain	Water Closet Drain
						EPA ID	LJ247	LJ202
Metals (mg/kg)								
Aluminum	--	--	--	--	--		199	1,140
Antimony	--	--	500	15	150		4	12 U
Arsenic	5	100	500	5	50		3.4	1.2 U
Barium	100	2,000	10,000	100	1,000		73.8	25.2
Beryllium	--	--	75	0.8	7.5		1 U	0.8 U
Cadmium	1	20	100	1	10		1.1	1.4
Calcium	--	--	--	--	--		113,000	8,400
Chromium	5	100	500	5	50		3.6	250
Cobalt	--	--	8,000	80	800		0.81 UJ	11.9
Copper	--	--	2,500	25	250		150	36
Iron	--	--	--	--	--		13,500	6,510
Lead ^c	5	100	1,000	5	50		15.4	<u>81.1</u>
Magnesium	--	--	--	--	--		1,720	1,000
Manganese	--	--	--	--	--		91.4	55.3
Mercury	0.2	4	20	0.2	2		0.1	0.54
Nickel	--	--	2,000	20	200		6	33.7
Potassium	--	--	--	--	--		539	3,090
Selenium	1	20	100	1	10		1.5 U	1.1
Silver	5	100	500	5	50		2.5 U	0.87 UJ
Sodium	--	--	--	--	--		791	33,500
Thallium	--	--	700	7	70		2 U	1.6 U
Vanadium	--	--	2,400	24	240		1.3	3.3
Zinc	--	--	5,000	250	2,500		225	1,030

Notes

Concentrations in **bold font** indicate values greater than 20 times TCLP and 10 times STLC.

Concentrations in **bold, italicized, and underlined font** indicate values greater than 10 times STLC.

^a Maximum concentration (mg/L) of contaminants for the toxicity characteristic determined by the Toxicity Characteristic Leaching Procedure.

^b Correction factor for estimating whether the concentration in a solid may exceed the TCLP value.

^c Total threshold limit concentration (mg/kg) (CCR Title 22).

^d Soluble Threshold Limit Concentration in milligrams per liter of waste extract determined using the Waste Extraction test (CCR Title 22).

^e Correction factor for estimating whether the concentration in a solid may exceed the STLC.

CCR = California Code of Regulations

EPA = Environmental Protection Agency

ID = identification

mg/kg= milligrams per kilogram

mg/L = milligrams per liter

PRL = potential release location

RCRA = Resource Conservation and Recovery Act

STLC = soluble threshold limit concentration

TCLP = toxicity characteristic leaching procedure

TTLC = total threshold limit concentration

U= indicates the compound or analyte was analyzed for but was not detected at or above the stated limit

UJ= indicates the compound or analyte was analyzed for but was not detected; the sample detection limit is an estimated value

Table A-2: Analytical Results and Preliminary Waste Characterization, Sink Drain Samples (Liquid Matrix), PRL 46

Analyte	TCLP ^a	STLC ^b	Sample Location	PRL46-DS1
			Sample Depth	Sink Drain
			EPA ID	LJ201
Metals (µg/L)				
Aluminum	--	--		178
Antimony	--	15,000		3.3
Arsenic	5,000	5,000		14.3 UJ
Barium	100,000	100,000		86.6
Beryllium	--	750		2 U
Cadmium	1,000	1,000		0.92
Calcium	--	--		429,000
Chromium	5,000	5,000		6.3
Cobalt	--	80,000		5
Copper	--	25,000		358
Iron	--	--		80,500
Lead ^c	5,000	5,000		34.3
Magnesium	--	--		30,700
Manganese	--	--		1,260
Mercury	200	200		0.77
Nickel	--	20,000		61.5
Potassium	--	--		1,130
Selenium	1,000	1,000		10 U
Silver	5,000	5,000		5.4
Sodium	--	--		75,100
Thallium	--	7,000		4.5 UJ
Vanadium	--	24,000		10 U
Zinc	--	250,000		297

Notes

^a Maximum concentration (µg/L) of contaminants for the toxicity characteristic determined by the Toxicity Characteristic Leaching Procedure.

^b Soluble Threshold Limit Concentration in micrograms per liter of waste extract determined using the Waste Extraction test.

EPA = Environmental Protection Agency

ID = identification

µg/L = micrograms per liter

PRL = potential release location

STLC = soluble threshold limit concentration

TCLP = toxicity characteristic leaching procedure

U= indicates the compound or analyte was analyzed for but was not detected at or above the stated limit

UJ= indicates the compound or analyte was analyzed for but was not detected; the sample detection limit is an estimated value

Appendix B
Validated Laboratory Analytical Data

Validated Analytical Data for PRL 46

EPA ID:			LJ541	LJ542	LJ543	LJ544	LJ556
Location ID:			PRL46-HA6	PRL46-HA7	PRL46-HA7	PRL46-HA8	PRL46-HA8
Sample Type:			SS	SS	SS	SS	SS
Sample Depth (feet bgs):			4	0.5	4	0.5	4
Sample Date:			03-May-05	03-May-05	03-May-05	03-May-05	03-May-05
Analytical Method ¹							
Parameter	Units						
Polynuclear/Aromatic Hydrocarbons							
Acenaphthene	ug/kg	PAH-SIM	28 U	29 U	29 U	26 U	29 U
Acenaphthylene	ug/kg	PAH-SIM	28 U	29 U	29 U	26 U	29 U
Anthracene	ug/kg	PAH-SIM	28 U	29 U	29 U	26 U	29 U
Benz(a)anthracene	ug/kg	PAH-SIM	28 U	29 U	29 U	26 U	1 J
Benzo(a)pyrene	ug/kg	PAH-SIM	28 U	29 U	29 U	26 U	1 J
Benzo(b)fluoranthene	ug/kg	PAH-SIM	28 U	29 U	29 U	2 J	2 J
Benzo(g,h,i)perylene	ug/kg	PAH-SIM	28 U	29 U	29 U	26 U	1 J
Benzo(k)fluoranthene	ug/kg	PAH-SIM	28 U	29 U	29 U	3 J	0.7 J
Chrysene	ug/kg	PAH-SIM	28 U	29 U	29 U	4 J	3 J
Dibenz(a,h)anthracene	ug/kg	PAH-SIM	28 U	29 U	29 U	26 U	29 U
Fluoranthene	ug/kg	PAH-SIM	28 U	29 U	29 U	1 J	1 J
Fluorene	ug/kg	PAH-SIM	28 U	29 U	29 U	26 U	29 U
Indeno(1,2,3-Cd)Pyrene	ug/kg	PAH-SIM	28 U	29 U	29 U	26 U	0.8 J
2-Methylnaphthalene	ug/kg	PAH-SIM	28 U	29 U	29 U	26 U	29 U
Naphthalene	ug/kg	PAH-SIM	28 U	29 U	29 U	26 U	29 U
Phenanthrene	ug/kg	PAH-SIM	28 U	29 U	29 U	26 U	29 U
Pyrene	ug/kg	PAH-SIM	28 U	29 U	29 U	2 J	1 J
Others							
Moisture	%	ASTM D 2216	9.7	15.2	13	4.9	12.8

Notes:

¹ = Environmental Protection Agency Method unless otherwise noted.

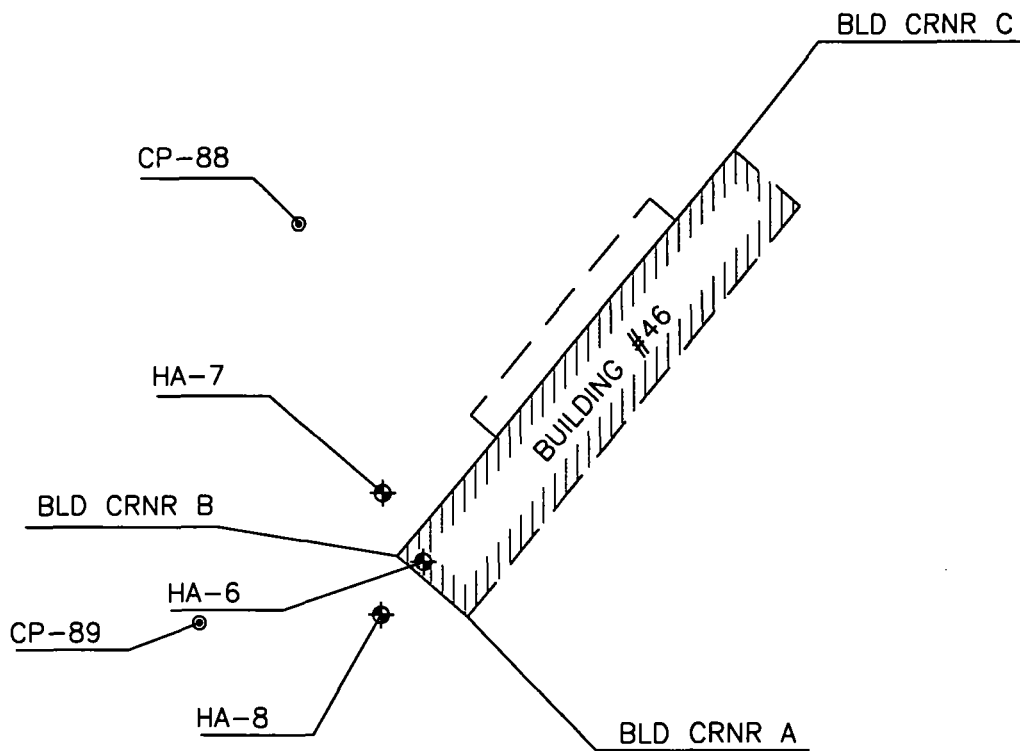
U = indicates the compound or analyte was analyzed for but was not detected at or above the stated limit.

J = indicates an estimated value

ASTM = American Society of Testing and Materials

SS = Soil Sample

Appendix C
Land Surveying Data



BUILDING #46 PRL AND NOTABLE FEATURES LOCATIONS			
STATION	NORTHING	EASTING	ELEVATION
BLD CRNR A	2193322.62	6107875.53	
BLD CRNR B	2193335.70	6107860.17	
BLD CRNR C	2193422.56	6107934.63	
CP 88	2193406.77	6107839.11	285.73
CP 89	2193321.39	6107816.58	284.71
BLD 46-HA 6	2193334.54	6107865.85	287.85
BLD 46-HA 7	2193349.27	6107856.97	285.75
BLD 46-HA 8	2193323.06	6107856.47	286.37



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POTENTIAL RELEASE LOCATION SKETCH
BUILDING #46

SCALE: 1" = 40' DATE: 06-06-05
BY: JCL JOB NO.: 04-1058-2227.000-535

Attachment 2
Summary Report
PRL 133



**Summary Report for PRL 133,
Environmental Baseline Survey**

**FORMER MARINE CORPS AIR STATION
EL TORO, CALIFORNIA**

July 2008

Prepared for:

**Base Realignment and Closure
Program Management Office West
San Diego, California**

Prepared by:

**Earth Tech, Inc.
841 Bishop Street, Suite 500
Honolulu, HI 96813-3920**

Prepared under:

**Naval Facilities Engineering Command
Contract Number N62742-94-D-0048
Contract Task Order 0068
DCN: ET-0048-0068-0008**

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APPENDICES

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ACRONYMS AND ABBREVIATIONS

µg/kg	micrograms per kilogram
bgs	below ground surface
BNI	Bechtel National, Inc.
COPC	constituent of potential concern
DTSC	Department of Toxic Substances Control
EPA	Environmental Protection Agency
EPC	exposure point concentration
HA	hand auger
HI	hazard index
ID	identification
J	indicates an estimated value
JS	jar sample
MCAS	Marine Corps Air Station
mg/kg	milligram per kilogram
mg/L	milligrams per liter
NAVFAC SW	Naval Facilities Engineering Command Southwest
NA	not analyzed
pH	negative logarithm of hydrogen ion concentration
PRG	preliminary remediation goal
PRL	potential release location
SRU	silver recovery unit
SVOC	semivolatile organic compound
U	indicates the compound or analyte was analyzed for but was not detected at or above the stated limit
UJ	indicates the compound or analyte was analyzed for but was not detected; the sample detection limit is an estimated value
UST	underground storage tank
VOC	volatile organic compound

1. Background

Potential Release Location (PRL) 133 is associated with Building 133, situated in the northeast quadrant of former Marine Corps Air Station (MCAS) El Toro, California (Figure 1). Building 133 was built as a Photographic Lab in 1943. The building was listed as a Photographic Lab in the 1948, 1949, 1950, and 1954 Station lists. The facility description was a Tactical Photo Lab in the 1958 list; a Location Exchange in the 1973 list; and an Office/Training Facility in the 1997 list; which was the last known description. Figure 2 shows the plan of Building 127 and the surrounding area.

Two locations of concern are associated with this site. UST 133 was a 500-gallon, underground storage tank (UST), which has been removed and the site has been closed by the Orange County Health Care Agency in a letter dated 12 November 1996. SRU 3B was a silver recovery unit (SRU) in the photography laboratory in the Office/Training Facility, which was recommended for further evaluation for potential discharges of contaminants to the building drainage system.

Investigations were initiated at Building 133 in April 2000 and March 2001 that included an inspection of the exterior of the building, a geophysical survey to locate sewer lines, potholing/trenching to expose and inspect sewer lines, and collection of a soil sample for analysis (Naval Facilities Engineering Command Southwest [NAVFAC SW] 2003 2002). The effort did not locate the original sewer lines but did locate a single line leading from the existing bathroom in the east end of the building toward the sewer trunk line in the parking lot. One soil sample was collected by hand auger (HA), about 1 foot below the exposed sewer pipe. A sewer clean-out fitting was observed on an interior wall that was formerly an exterior wall. The original sewer line, which has been either removed or cut and capped, was not located during the investigations. The soil sample collected was analyzed for volatile organic compounds (VOCs) and metals (including mercury). No VOCs were detected above the laboratory reporting limits with the exception of trichloroethylene, which was reported at an estimated concentration of 0.8 micrograms per kilogram. Aluminum, antimony, selenium, silver, sodium, and thallium were reported above the established background levels for former MCAS El Toro (Bechtel National, Inc. [BNI] 1996), but below their respective residential preliminary remediation goals (PRGs). Arsenic was reported at 2.15 milligrams per kilogram (mg/kg), above the industrial PRG, but below the former MCAS El Toro background level of 6.86 mg/kg. In a letter dated 8 April 2002, the Department of Toxic Substances Control (DTSC) requested additional investigation to evaluate the potential for releases of VOCs, metals, acids (measured by negative logarithm of hydrogen ion concentration [pH]), cyanide, and semivolatile organic compounds (SVOCs). Points to be investigated included where plumbing currently (and formerly) penetrates the slab; below the hand sink discharge to the storm drain; beneath the storm drain; and at sharp bends in sub-slab plumbing.

2. Issues and Concerns

The following issues and concerns associated with PRL 133 were identified during the records review, previous investigations, and visual site inspection conducted in 2002 in support of the 2003 Environmental Baseline Survey (NAVFAC SW 2003):

- The former use of the building as a photograph processing laboratory may have involved the use and discharge of photographic process chemicals and dissolved metals (i.e., silver from the SRU). Other processes conducted in the building may have resulted in discharges of paint, solvents, paint removers, rust removers, and reproduction chemicals. Further investigation was recommended.

A sampling program was proposed to further investigate the issues identified and assess whether a release to the environment of hazardous substances or pollutants has occurred. A summary of soil sampling activities is presented in Section 3, and the results are presented in Section 4.

3. Sampling and Analysis Summary

Soil sampling to evaluate PRL 133 was conducted in January and February 2003. The sampling locations are shown on Figure 2, and a sampling and analysis summary is provided in Table 1.

Soil samples were collected at two locations at PRL 133. Two samples (including a duplicate soil sample) were collected at location HA1 next to the storm drain into which the service sink discharges. One soil sample was collected at location HA2 next to the sewer line leading to the bathroom. The samples were collected using HA equipment at depths of 1-foot to 2 feet below ground surface (bgs) and 2.5 feet to 3.5 feet bgs at HA1 and HA2, respectively, and analyzed for VOCs, SVOCs, metals, cyanide, and pH.

In addition, to evaluate constituents in the drains, two liquid drain samples (DS1 and DS2) were collected from the bathroom sink and service sink p-trap, and analyzed for metals. The analytical results for these drain samples are presented in Appendix A, and in the Environmental Baseline Survey (NAVFAC SW 2003). The results were compared to Federal and State waste characterization thresholds. This data should be taken into consideration during the proposed removal of the residuals in the drains.

4. Investigation Results

This section presents analytical results and discusses the results of data evaluation and risk screening.

4.1 ANALYTICAL RESULTS AND QUALITY ASSURANCE

The analytical results for the samples collected at PRL 133 along with the United States Environmental Protection Agency (EPA) Region 9 or California-modified residential PRGs (EPA 2004a) are presented in Table 2. Appendix B presents the validated laboratory analytical data and Appendix C presents the land surveying data.

Some results were qualified as estimated in the data validation process. These qualifications do not affect the findings or conclusions of this report.

4.2 RESULTS EVALUATION AND RISK SCREENING

The pH values indicate that the soil is basic, and do not indicate that releases of acidic substances have occurred in the vicinity of the sampling locations.

Cyanide was not detected above laboratory reporting limits. None of the reported VOCs (methylene chloride and xylenes) or SVOCs [bis(2-ethylhexyl)phthalate] exceeded its residential PRGs (EPA 2004a). None of the metals exceeded its respective residential PRG or the former MCAS El Toro background value (BNI 1996).

Risk screening was performed to evaluate risks associated with potential exposures to detected analytes in the soil at PRL 133. The methodology for risk screening is presented in Section 3.3 of the main text of the Summary Report, and results are presented in Table 3.

The cumulative maximum carcinogenic risk due to potential exposure to maximum detected concentrations of constituents of potential concern (COPCs) (detected analytes) at PRL 133 is 6.0E-08, which is less than the background risk of 1.4E-07. The cumulative maximum noncancer hazard associated with potential exposure to maximum detected concentrations of COPCs, expressed as the hazard index (HI), is 1.5, which is less than the background HI of 2.2. The maximum exposure point concentrations (EPCs) for iron (15,300 mg/kg) and vanadium (34.6 mg/kg) reported in the soil sample at location HA1 at 1 foot to 2 feet bgs account for about 43% and 29% of the nancancer HI, respectively. However, the EPCs for both iron and vanadium are less than their respective former MCAS El Toro background values (18,400 mg/kg for iron and 71.8 mg/kg for vanadium) and their respective residential PRGs (23,463.18 mg/kg for iron and 78.21 mg/kg for vanadium).

5. Conclusions and Recommendations

The primary objective of investigations conducted at PRL 133 was to assess whether a release of hazardous substances or pollutants into the environment has occurred. A review of available records, visual site inspections, and soil sampling analytical data indicates that a release of hazardous substances or pollutants has not occurred at PRL 133. The reported concentrations of all COPCs were less than their respective residential PRGs and former MCAS El Toro background values, and are not indicative of a release. The resulting cumulative cancer risk at PRL 133 is less than the Station background risk, and the noncancer hazard is less than the background noncancer hazard. Therefore, no further investigation is recommended for PRL 133.

6. References

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Tables

Table 1: Sampling and Analysis Summary – PRL 133

Analytical Group and Method ^a	Sample Location	HA1	HA1	HA2	DS1	DS2
	EPA ID	LJ167	LJ168*	LJ169	LJ210	LJ211
	Sample Depth (feet bgs)	1-2	1-2	2.5-3.5	NA	NA
	Sampling Technique	HA	HA	HA	JS	JS
VOCs 8260B		X	X	X	—	—
SVOCs 8270C		X	X	X	—	—
Metals 6010B and 7471A		X	X	X	X	X
Cyanide 9010B		X	X	X	—	—
pH 9045C		X	X	X	—	—

Notes:

* Duplicate sample collected.

^a Analysis was in general accordance with the listed methods provided in EPA Publication SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.

— = not analyzed

bgs = below ground surface

EPA = Environmental Protection Agency

HA = hand auger

ID = identification

JS = jar sample

NA = not applicable

pH = negative logarithm of hydrogen ion concentration

SVOC = semivolatile organic compound

VOC = volatile organic compound

X = analysis was performed for the specified analyte

Table 2: Analytical Results Summary - PRL 133

Analyte	MCAS El Toro	Residential Soil PRG ^b	Sample Location	PRL133-HA1	PRL133-HA1	PRL133-HA2
	Background Value		Sample Depth	1.0-2.0 feet bgs	1.0-2.0 feet bgs	1.0-2.5 feet bgs
	(95th quantile) ^a		EPA ID	LJ167	LJ168	LJ169
Volatile Organic Compounds (µg/kg)						
Methylene Chloride	—	9.1E+03		1 J	5.7 U	1 J
Total Xylenes	—	2.7E+05		2 J	17 U	14 U
Semi-Volatile Organic Compounds (µg/kg)						
Bis(2-ethylhexyl)phthalate	—	3.5E+04		570 U	30 J	530 U
Metals (mg/kg)						
Aluminum	14,800	7.6E+04		11,500	12,400	5,440
Arsenic	6.86	3.9E-01		2.5 UJ	3.1 UJ	1.5 UJ
Barium	173	5.4E+03		142	134	71.2
Cadmium	2.35	3.7E+01		0.18 UJ	0.25 UJ	0.21 UJ
Calcium	46,000	—		8,660	6,150	4,930
Chromium	26.9	2.1E+02		10	10.8	5.3
Cobalt	6.98	9.0E+02		6.7	6.9	2.3
Copper	10.5	3.1E+03		6.6	8	2.5
Iron	18,400	2.3E+04		15,300	15,300	6,430
Lead ^c	15.1	1.5E+02		2.3	3.9	9.5
Magnesium	8,370	—		5,570	5,730	2,350
Manganese	291	1.8E+03		283 J	234 J	112 J
Mercury	0.22	2.3E+01		0.0059	0.089	0.034
Nickel	15.3	1.6E+03		6.4 J	6.6 J	3.4 J
Potassium	4,890	—		3,470	3,300	1,170
Selenium	0.32	3.9E+02		1.4 U	0.57 UJ	1.3 U
Silver	0.539	3.9E+02		2.3 U	2.4 U	2.1 U
Sodium	405	—		460 U	480 U	420 U
Thallium	0.42	5.2E+00		1.8 U	1.9 U	1.7 U
Vanadium	71.8	7.8E+01		34.6	33.2	15.6
Zinc	77.9	2.3E+04		45.4	54.6	26.3
General Chemistry						
pH	—	—		7.98	8.57	8.68

Notes

^a Source: BNI 1996

^b Analytical results were compared to EPA Region 9 residential PRGs (2004a), with the exception of lead (see note c)

^c Analytical results for lead were compared to California-modified residential PRGs (2004a) because they are significantly more protective than the corresponding EPA Region 9 PRGs

— = value does not exist

µg/kg = micrograms per kilogram

bgs = below ground surface

BNI = Bechtel National, Inc.

EPA = Environmental Protection Agency

ID = identification

J = indicates an estimated value

MCAS = Marine Corps Air Station

mg/kg = milligrams per kilogram

NA = not analyzed

pH = negative logarithm of hydrogen ion concentration

PRG = preliminary remediation goal

PRL = potential release location

RCRA = Resource Conservation and Recovery Act

U = indicates the compound or analyte was analyzed for but was not detected at or above the stated limit

UJ = indicates the compound or analyte was analyzed for but was not detected; the sample detection limit is an estimated value

Table 3: Risk Screening Results - PRL 133

COPC	Maximum EPC	MCAS El Toro Background Value (95th quantile) ^a	Carcinogenic PRG ^b	Noncarcinogenic PRG ^b	Risk Corresponding to Maximum EPC				Risk Corresponding to Background			
					Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic	
					Excess Cancer Risk ^c	Percent Contribution to Cancer Risk ^d	HI ^e	Percent Contribution to Noncancer Risk ^d	Excess Cancer Risk ^f	Percent Contribution to Cancer Risk ^g	Hih	Percent Contribution to Noncancer Risk ^g
Volatile Organic Compounds (VOCs) (µg/kg)												
Methylene Chloride	1	--	9.1E+03	2.0E+06	--	--	5.1E-07	0.0%	--	--	--	--
Total Xylenes	2	--	--	2.7E+05	--	--	7.4E-06	0.0%	--	--	--	--
Semi-Volatile Organic Compounds (VOCs) (µg/kg)												
Bis(2-ethylhexyl)phthalate	30	--	3.5E+04	1.2E+06	8.6E-10	8.6E-10	2.5E-05	0.0%	--	--	--	--
Metals (mg/kg)												
Aluminum	12,400	14,800	--	7.6E+04	--	--	1.6E-01	10.7%	--	--	1.9E-01	8.7%
Barium	142	173	--	5.4E+03	--	--	2.6E-02	1.7%	--	--	3.2E-02	1.4%
Calcium	8,660	46,000	--	--	--	--	--	--	--	--	--	--
Chromium	10.8	26.9	2.1E+02	--	5.1E-08	86%	--	--	1.3E-07	94.3%	--	--
Cobalt	6.9	6.98	9.0E+02	1.4E+03	7.6E-09	13%	5.0E-03	0.3%	7.7E-09	5.7%	5.1E-03	0.2%
Copper	8	10.5	--	3.1E+03	--	--	2.6E-03	0.2%	--	--	3.4E-03	0.2%
Iron	15,300	18,400	--	2.3E+04	--	--	6.5E-01	42.7%	--	--	7.8E-01	35.2%
Lead ⁱ	9.5	15.1	--	1.5E+02	--	--	6.3E-02	4.2%	--	--	1.0E-01	4.5%
Magnesium	5,730	8,370	--	--	--	--	--	--	--	--	--	--
Manganese	283	291	--	1.8E+03	--	--	1.6E-01	10.5%	--	--	1.7E-01	7.4%
Mercury	0.089	0.22	--	2.3E+01	--	--	3.8E-03	0.2%	--	--	9.4E-03	0.4%
Nickel	6.6	15.3	--	1.6E+03	--	--	4.2E-03	0.3%	--	--	9.8E-03	0.4%
Potassium	3,470	4,890	--	--	--	--	--	--	--	--	--	--
Vanadium	34.6	71.8	--	7.8E+01	--	--	4.4E-01	29.0%	--	--	9.2E-01	41.2%
Zinc	54.6	77.9	--	2.3E+04	--	--	2.3E-03	0.2%	--	--	3.3E-03	0.1%
Cumulative Maximum Risk					6.0E-08		1.5E+00		1.4E-07		2.2E+00	

Notes:

^a Source: BNI 1996

^b United States EPA Region 9 residential preliminary remediation goals (PRGs) (2004a)

^c Excess cancer risk = 1E-06 x (Maximum EPC/Carcinogenic PRG)

^d With respect to cumulative excess cancer risk or hazard index

^e HI = Maximum EPC / Noncarcinogenic PRG

^f Excess cancer risk = 1E-06 x (MCAS El Toro Background or Anthropogenic Concentration/Carcinogenic PRG)

^g With respect to cumulative excess cancer risk or hazard index

^h HI = MCAS El Toro Background or Anthropogenic Concentration / Noncarcinogenic PRG

ⁱ = Analytical results for lead were compared to California-modified PRGs (2004a) because they are significantly more protective than the corresponding EPA Region 9 PRGs

-- = value does not exist

µg/kg= micrograms per kilogram

BNI = Bechtel National, Inc.

COPC = constituent of potential concern

EPA = Environmental Protection Agency

EPC = exposure point concentration

HI = hazard index

MCAS = Marine Corps Air Station

mg/kg= milligrams per kilogram

PRG = preliminary remediation goal

PRL = potential release location

Figures



Service Sink: Drain Sample DS2
Collected From P-trap
(Facing Northeast)

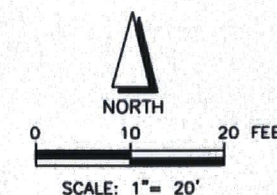


Soil Sample HA1 Collected
Next to Storm Drain
(Facing Southwest)



LEGEND:

- Edge of Road
- Sewer Line
- Storm Drain Catch Basin
- Sink
- Carve-out Boundary
- DS2** Drain Sample Location (Earth Tech, 2003)
(Analytes: Metals)
- HA2** Soil Sample Location (Earth Tech, 2003)
(Sample Depth: 1 to 3.5 ft bgs;
Analytes: VOCs, SVOCs, Metals, Cyanide,
and pH)



Note: Features and interior layout are approximate and may not be to scale

Summary Report

**Site Plan
PRL 133**

Environmental Baseline Survey

Date: 07-08

Former MCAS El Toro

Project No.

29307


EarthTech
A Tyco International Ltd. Company

Figure

2

Appendix A
Drain Sampling Results

Table A-1: Analytical Results and Preliminary Waste Characterization Summary, Sink Drain Samples (Liquid Matrix), PRL 133

Analyte	RCRA Hazardous Waste	California Hazardous Waste	Sample Location	PRL133-DS1	PRL133-DS2
	TCLP ^a	STLC ^b	Sample Type	Sink Drain ^c	Sink Drain ^c
			EPA ID	LJ210	LJ211
Metals (µg/L)					
Aluminum	--	--		4,370	8,330
Antimony	--	15,000		20 UJ	10 U
Arsenic	5,000	5,000		56.5	60.3
Barium	100,000	100,000		732	499
Beryllium	--	750		4 U	2 U
Cadmium	1,000	1,000		36.7	12.3
Calcium	--	--		167,000	33,500
Chromium	5,000	5,000		136	66.1
Cobalt	--	80,000		14.4	13
Copper	--	25,000		1,200,000	21,600
Iron	--	--		5,990	24,000
Lead	5,000	5,000		1,390	960
Magnesium	--	--		39,500	25,100
Manganese	--	--		126	187
Mercury	200	200		3.6	4.2
Nickel	--	20,000		8,080	851
Potassium	--	--		359,000	26,400
Selenium	1,000	1,000		17	10 U
Silver	5,000	5,000		53.7	6.3
Sodium	--	--		920,000	325,000
Thallium	--	7,000		124	14.5
Vanadium	--	24,000		5.1	47
Zinc	--	250,000		808,000	190,000

Notes

Concentrations in **bold font** indicate values, greater than their respective STLCs, thereby classifying the material as California-regulated, non-RCRA hazardous waste.

^a Maximum concentration (µg/L) of contaminants for the toxicity characteristic determined by the Toxicity Characteristic Leaching Procedure

^b Soluble Threshold Limit Concentration in µg/L of waste extract determined using the Waste Extraction test (California Code of Regulations Title 22)

^c Drain samples collected from sink p-traps were liquid and analytical results are reported in µg/L

-- = value does not exist

µg/L= micrograms per liter

EPA = Environmental Protection Agency

ID = identification

PRL = potential release location

RCRA = Resource Conservation and Recovery Act

STLC = soluble threshold limit concentration

TCLP = toxicity characteristic leaching procedure

U= indicates the compound or analyte was analyzed for but was not detected at or above the stated limit

UJ= indicates the compound or analyte was analyzed for but was not detected; the sample detection limit is an estimated value

Appendix B
Validated Laboratory Analytical Data Reports

Validated Analytical Data for PRL 133

		EPA ID:	LJ167	LJ168	LJ169	LJ210	LJ211
		Location ID:	PRL133-HA1	PRL133-HA1 (dup)	PRL133-HA2	PRL133-DS1	PRL133-DS2
		Sample Type:	SS	SS	SS	DS	DS
		Sample Depth (feet bgs) :	1.0-2.0	1.0-2.0	2.5-3.5	NA	NA
		Sample Date:	30-Jan-03	30-Jan-03	30-Jan-03	26-Feb-03	27-Feb-03
Parameter	Units	Analytical Method ¹					
Volatile Organic Compounds							
1,1,1,2-Tetrachloroethane	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
1,1,1-Trichloroethane	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
1,1,2,2-Tetrachloroethane	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
1,1,2-Trichloroethane	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
1,1,2-Trichlorotrifluoroethane	ug/kg	8260B	5.3 UJ	5.7 UJ	4.7 UJ	--	--
1,1-Dichloroethane	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
1,1-Dichloroethene	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
1,2-Dichloroethane	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
1,2-Dichloropropane	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
1,2-Dichlorotetrafluoroethane	ug/kg	8260B	5.3 UJ	5.7 UJ	4.7 UJ	--	--
2-Butanone	ug/kg	8260B	110 U	110 U	94 U	--	--
2-Hexanone	ug/kg	8260B	53 UJ	57 UJ	47 UJ	--	--
4-Methyl-2-pentanone	ug/kg	8260B	53 UJ	57 UJ	47 UJ	--	--
Acetone	ug/kg	8260B	110 U	110 U	94 U	--	--
Benzene	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
Bromodichloromethane	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
Bromoform	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
Bromomethane	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
Carbon Disulfide	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
Carbon Tetrachloride	ug/kg	8260B	5.3 UJ	5.7 UJ	4.7 UJ	--	--
Chlorobenzene	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
Chloroethane	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
Chloroform	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
Chloromethane	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
cis-1,2-Dichloroethene	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
cis-1,3-Dichloropropene	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
Dibromochloromethane	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
Dichlorodifluoromethane (Freon-12)	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
Di-isopropyl Ether (DIPE)	ug/kg	8260B	5.3 UJ	5.7 UJ	4.7 UJ	--	--
Ethyl tertiary butyl ether	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
Ethylbenzene	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
Methylene Chloride	ug/kg	8260B	1 J	5.7 U	1 J	--	--
Methyl-tert butyl ether (MTBE)	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--

		EPA ID:	LJ167	LJ168	LJ169	LJ210	LJ211
		Location ID:	PRL133-HA1	PRL133-HA1 (dup)	PRL133-HA2	PRL133-DS1	PRL133-DS2
		Sample Type:	SS	SS	SS	DS	DS
		Sample Depth (feet bgs) :	1.0-2.0	1.0-2.0	2.5-3.5	NA	NA
		Sample Date:	30-Jan-03	30-Jan-03	30-Jan-03	26-Feb-03	27-Feb-03
Parameter	Units	Analytical Method ¹					
Styrene	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
Tertiary amyl methyl ether	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
Tertiary Butyl Alcohol	ug/kg	8260B	21 UJ	23 UJ	19 UJ	--	--
Tetrachloroethene (PCE)	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
Toluene	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
Total Xylenes	ug/kg	8260B	2 J	17 U	14 U	--	--
Trans-1,2-Dichloroethene	ug/kg	8260B	5.3 UJ	5.7 UJ	4.7 UJ	--	--
Trans-1,3-Dichloropropene	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
Trichloroethene (TCE)	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
Trichlorofluoromethane (Freon-11)	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
Vinyl Chloride	ug/kg	8260B	5.3 U	5.7 U	4.7 U	--	--
Semi-Volatile Organic Compounds							
1,2,4-Trichlorobenzene	ug/kg	8270C	570 U	600 U	530 U	--	--
1,2-Dichlorobenzene	ug/kg	8270C	570 U	600 U	530 U	--	--
1,3-Dichlorobenzene	ug/kg	8270C	570 U	600 U	530 U	--	--
1,4-Dichlorobenzene	ug/kg	8270C	570 U	600 U	530 U	--	--
2,2'-Oxybis(1-chloropropane)	ug/kg	8270C	570 U	600 U	530 U	--	--
2,4,5-Trichlorophenol	ug/kg	8270C	570 U	600 U	530 U	--	--
2,4,6-Trichlorophenol	ug/kg	8270C	570 U	600 U	530 U	--	--
2,4-Dichlorophenol	ug/kg	8270C	570 U	600 U	530 U	--	--
2,4-Dimethylphenol	ug/kg	8270C	570 UJ	600 UJ	530 UJ	--	--
2,4-Dinitrophenol	ug/kg	8270C	2900 U	3000 U	2600 U	--	--
2,4-Dinitrotoluene	ug/kg	8270C	570 U	600 U	530 U	--	--
2,6-Dinitrotoluene	ug/kg	8270C	570 U	600 U	530 U	--	--
2-Chloronaphthalene	ug/kg	8270C	570 U	600 U	530 U	--	--
2-Chlorophenol	ug/kg	8270C	570 U	600 U	530 U	--	--
2-Methylphenol	ug/kg	8270C	570 U	600 U	530 U	--	--
2-Nitroaniline	ug/kg	8270C	2900 U	3000 U	2600 U	--	--
2-Nitrophenol	ug/kg	8270C	570 U	600 U	530 U	--	--
3,3'-Dichlorobenzidine	ug/kg	8270C	1100 U	1200 U	1100 U	--	--
3/4-methylphenol	ug/kg	8270C	570 U	600 U	530 U	--	--
3-Nitroaniline	ug/kg	8270C	2900 U	3000 U	2600 U	--	--
4,6-Dinitro-2-methylphenol	ug/kg	8270C	2900 U	3000 U	2600 U	--	--
4-Bromophenyl-phenylether	ug/kg	8270C	570 U	600 U	530 U	--	--
4-Chloro-3-Methylphenol	ug/kg	8270C	570 U	600 U	530 U	--	--

		EPA ID:	LJ167	LJ168	LJ169	LJ210	LJ211
		Location ID:	PRL133-HA1	PRL133-HA1 (dup)	PRL133-HA2	PRL133-DS1	PRL133-DS2
		Sample Type:	SS	SS	SS	DS	DS
		Sample Depth (feet bgs) :	1.0-2.0	1.0-2.0	2.5-3.5	NA	NA
		Sample Date:	30-Jan-03	30-Jan-03	30-Jan-03	26-Feb-03	27-Feb-03
Parameter	Units	Analytical Method ¹					
4-Chloroaniline	ug/kg	8270C	1100 U	1200 U	1100 U	--	--
4-Chlorophenyl-phenyl ether	ug/kg	8270C	570 U	600 U	530 U	--	--
4-Nitroaniline	ug/kg	8270C	2900 U	3000 U	2600 U	--	--
4-Nitrophenol	ug/kg	8270C	2900 U	3000 U	2600 U	--	--
bis(2-chloroethoxy)methane	ug/kg	8270C	570 U	600 U	530 U	--	--
bis(2-chloroethyl)ether	ug/kg	8270C	570 U	600 U	530 U	--	--
bis(2-ethylhexyl)phthalate	ug/kg	8270C	570 U	30 J	530 U	--	--
Butylbenzylphthalate	ug/kg	8270C	570 U	600 U	530 U	--	--
Carbazole	ug/kg	8270C	570 U	600 U	530 U	--	--
Dibenzofuran	ug/kg	8270C	570 U	600 U	530 U	--	--
Diethylphthalate	ug/kg	8270C	570 U	600 U	530 U	--	--
Dimethylphthalate	ug/kg	8270C	570 U	600 U	530 U	--	--
Di-n-butylphthalate	ug/kg	8270C	570 U	600 U	530 U	--	--
Di-n-octylphthalate	ug/kg	8270C	570 U	600 U	530 U	--	--
Hexachlorobenzene	ug/kg	8270C	570 U	600 U	530 U	--	--
Hexachlorobutadiene	ug/kg	8270C	570 U	600 U	530 U	--	--
Hexachlorocyclopentadiene	ug/kg	8270C	2900 U	3000 U	2600 U	--	--
Hexachloroethane	ug/kg	8270C	570 U	600 U	530 U	--	--
Isophorone	ug/kg	8270C	570 U	600 U	530 U	--	--
Nitrobenzene	ug/kg	8270C	570 U	600 U	530 U	--	--
n-Nitrosodi-n-propylamine	ug/kg	8270C	570 U	600 U	530 U	--	--
n-Nitroso-diphenylamine	ug/kg	8270C	2900 U	3000 U	2600 U	--	--
Pentachlorophenol	ug/kg	8270C	1900 U	2000 U	1800 U	--	--
Phenol	ug/kg	8270C	570 U	600 U	530 U	--	--
Metals							
Aluminum	mg/kg	6010B	11500	12400	5440	4370	8330

		EPA ID:	LJ167	LJ168	LJ169	LJ210	LJ211
		Location ID:	PRL133-HA1	PRL133-HA1 (dup)	PRL133-HA2	PRL133-DS1	PRL133-DS2
		Sample Type:	SS	SS	SS	DS	DS
		Sample Depth (feet bgs) :	1.0-2.0	1.0-2.0	2.5-3.5	NA	NA
		Sample Date:	30-Jan-03	30-Jan-03	30-Jan-03	26-Feb-03	27-Feb-03
Parameter	Units	Analytical Method ¹					
Antimony	mg/kg	6010B	14 U	14 U	13 U	20 UJ	10 U
Arsenic	mg/kg	6010B	2.5 UJ	3.1 UJ	1.5 UJ	56.5	60.3
Barium	mg/kg	6010B	142	134	71.2	732	499
Berillium	mg/kg	6010B	0.91 U	0.96 U	0.84 U	4 U	2 U
Cadmium	mg/kg	6010B	0.18 UJ	0.25 UJ	0.21 UJ	36.7	12.3
Calcium	mg/kg	6010B	8660	6150	4930	167000	33500
Chromium	mg/kg	6010B	10	10.8	5.3	136	66.1
Cobalt	mg/kg	6010B	6.7	6.9	2.3	14.4	13
Copper	mg/kg	6010B	6.6	8	2.5	1200000	21600
Iron	mg/kg	6010B	15300	15300	6430	5990	24000
Lead	mg/kg	6010B	2.3	3.9	9.5	1390	960
Magnesium	mg/kg	6010B	5570	5730	2350	39500	25100
Manganese	mg/kg	6010B	283 J	234 J	112 J	126	187
Mercury	mg/kg	7471A	0.0059	0.089	0.034	3.6	4.2
Nickel	mg/kg	6010B	6.4 J	6.6 J	3.4 J	8080	851
Potassium	mg/kg	6010B	3470	3300	1170	359000	26400
Selenium	mg/kg	6010B	1.4 U	0.57 UJ	1.3 U	17	10 U
Silver	mg/kg	6010B	2.3 U	2.4 U	2.1 U	53.7	6.3
Sodium	mg/kg	6010B	460 U	480 U	420 U	920000	325000
Thallium	mg/kg	6010B	1.8 U	1.9 U	1.7 U	124	14.5
Vanadium	mg/kg	6010B	34.6	33.2	15.6	5.1	47
Zinc	mg/kg	6010B	45.4	54.6	26.3	808000	190000
General Chemistry							
Cyanide	mg/kg	9010B	2.9 U	3 U	2.6 U	--	--
pH	pH	9045C	7.98	8.57	8.68	--	--

Notes:

¹ = Environmental Protection Agency Method unless otherwise noted.

U = indicates the compound or analyte was analyzed for but was not detected at or above the stated limit.

J = indicates an estimated value

UJ = indicates the compound or analyte was analyzed for but was not detected. The sample detection limit is an estimated value.

-- = not analyzed

NA= not applicable

ASTM = American Society of Testing and Materials

DS= drain sample

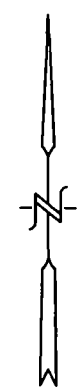
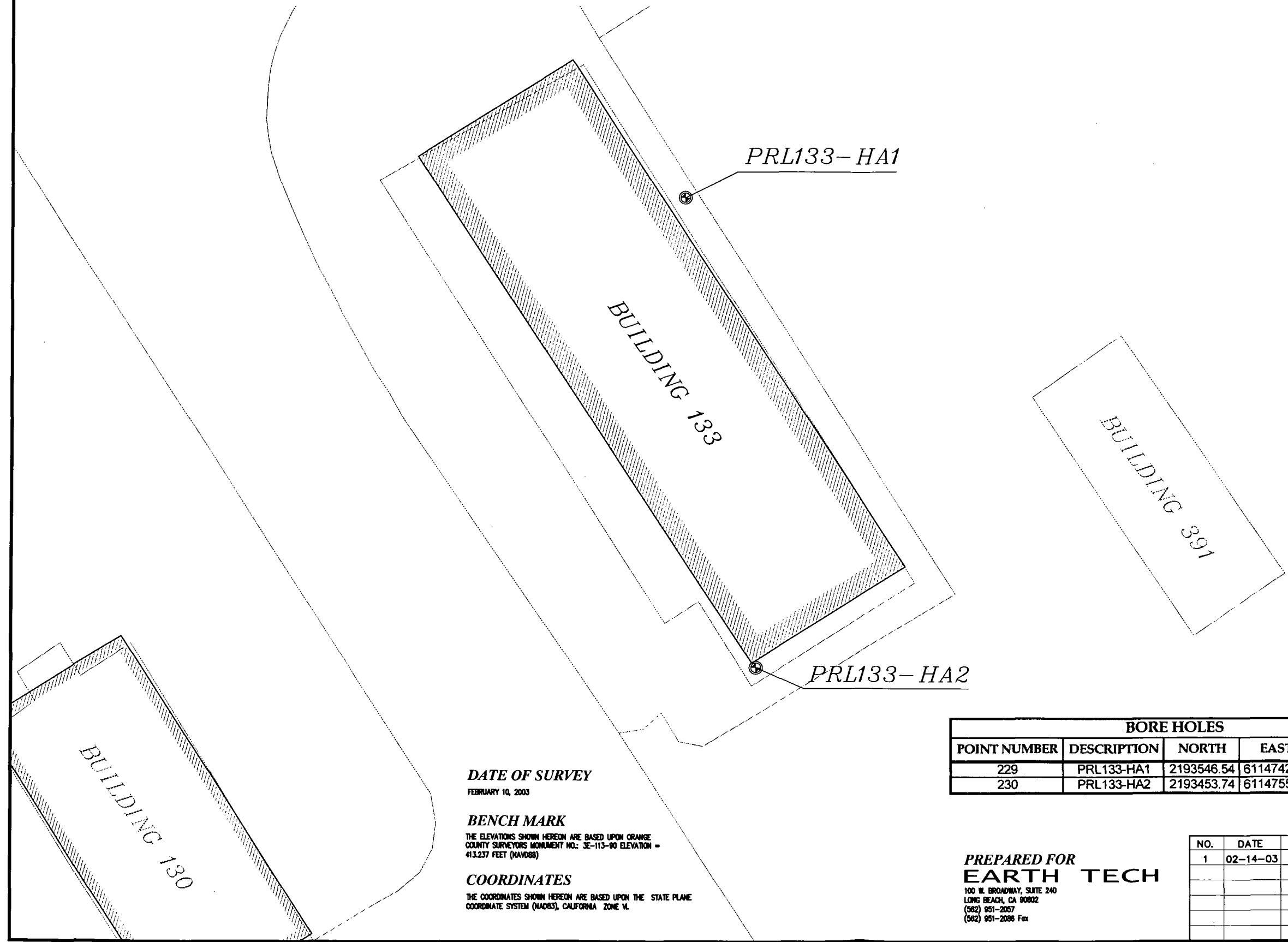
SS = Soil Sample

Appendix C
Land Surveying Data

SITE PLAN

BORE HOLE LOCATIONS

PROJECT MCAS EL TORO PRL 133
ELTORO MARINE BASE EL TORO, CA



Legend		
AC	ASPHALT PAVING	MONITORING WELL
BH	BORE HOLE	SPARGE POINT
CLF	CHAIN LINK FENCE	VAPOR EXTRACTION WELLS
EB	ELECTRIC BOX	VAPOR EXTRACTION VALVES
EMB	ELECTRIC MAN HOLE	BORE HOLE
EV	ELECTRIC VAULT	TOP OF RM
FS	FINISH SURFACE	TOP OF CASING
FR	FIRE RISER	TOP OF CURB
GM	GAS METER	TOP OF CURB
GV	GAS VAULT	FLOW LINE
PHV	PHONE VAULT	RAILROAD TRACKS
SD	SEWER CLEAN OUT	PARKING LOT LIGHT
SD	STORM DRAIN	WOOD FENCE
TV	TELEPHONE VAULT	CHAIN LINK FENCE
TWH	TELEPHONE MAN HOLE	CATCH BASIN
TOW	TOP OF WALL	LANDSCAPE TREE
UB	UTILITY BOX	CENTER LINE
VLT	VAULT	PROPERTY LINE
WB	WATER BOX	FIRE HYDRANT
WM	WATER METER	LIGHT
WVS	WATER VALVES	

BORE HOLES				
POINT NUMBER	DESCRIPTION	NORTH	EAST	ELEVATION
229	PRL133-HA1	2193546.54	6114742.30	410.58
230	PRL133-HA2	2193453.74	6114755.82	411.03

DATE OF SURVEY
FEBRUARY 10, 2003

BENCH MARK
THE ELEVATIONS SHOWN HEREON ARE BASED UPON ORANGE COUNTY SURVEYORS MONUMENT NO. 3E-113-90 ELEVATION = 413.237 FEET (NAV088)

COORDINATES
THE COORDINATES SHOWN HEREON ARE BASED UPON THE STATE PLANE COORDINATE SYSTEM (NAD83), CALIFORNIA ZONE 11.

PREPARED FOR
EARTH TECH
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LONG BEACH, CA 90802
(562) 951-2057
(562) 951-2086 Fax

NO.	DATE	REVISIONS	BY
1	02-14-03	SUBMITTAL	HP/DG

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SHEET 3 OF 21

Attachment 3
Summary Report
PRL 312



Summary Report for PRL 312, Environmental Baseline Survey

FORMER MARINE CORPS AIR STATION EL TORO, CALIFORNIA

July 2008

Prepared for:
**Base Realignment and Closure
Program Management Office West
San Diego, California**

Prepared by:
**Earth Tech, Inc.
841 Bishop Street, Suite 500
Honolulu, HI 96813-3920**

Prepared under:
**Naval Facilities Engineering Command
Contract Number N62742-94-D-0048
Contract Task Order 0068
DCN: ET-0048-0068-0008**

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ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
BNI	Bechtel National, Inc.
COPC	constituent of potential concern
DON	Department of the Navy
EPA	Environmental Protection Agency
EPC	exposure point concentration
HA	hand auger
HI	hazard index
ID	identification
J	indicates an estimated value
IRP	Installation Restoration Program
MCAS	Marine Corps Air Station
mg/kg	milligrams per kilogram
NAVFAC SW	Naval Facilities Engineering Command Southwest
PRG	preliminary remediation goal
PRL	potential release location
RFA	Resource Conservation and Recovery Act Facility Assessment
U	indicates the compound or analyte was analyzed for but was not detected at or above the stated limit
UJ	indicates the compound or analyte was analyzed for but was not detected; the sample detection limit is an estimated value

1. Background

Potential Release Location (PRL) 312 is associated with Building 312, located in the southwest quadrant of former Marine Corps Air Station (MCAS) El Toro, California (Figure 1). The building was listed as a Photo Laboratory in the 1948, 1949, 1950, and 1954 Station lists; and as the Station Photo Laboratory in the 1958 list. The facility description was a Photographic Building in the 1973 and 1997 Station lists and this was the last known description. Figure 2 shows the plan of Building 312 and the surrounding area.

One location of concern was previously associated with this site. Silver Recovery Unit Number 3 included several units that were part of the photographic processing activities conducted in the dark rooms in Building 312. Liquid wastes from photographic processing activities were discharged from chemical sinks through the floor drains to the industrial waste (acid) lines (Department of the Navy [DON] 1954). The photographic processing operations were transferred to Building 443 in January 1993. Past investigations at or near Building 312 include groundwater sampling, soil gas survey, and an investigation of the industrial waste sewer lines as Solid Waste Management Unit 265 conducted during the Resource Conservation and Recovery Act Facility Assessment (RFA) (Naval Facilities Engineering Command Southwest [NAVFAC SW] 1993), which were subsequently evaluated as Installation Restoration Program (IRP) Site 23. The nearest RFA sample points to Building 312 were boring 265B5 located approximately 150 feet east of the building and boring 265B4 located approximately 400 feet west-northwest of the building (these points are located beyond the area shown on Figure 2). The Base Realignment and Closure Cleanup Team agreed to no further action status for IRP Site 23 (NAVFAC SW 1998). The groundwater sampling and soil gas surveys showed that soils and groundwater beneath Building 312 had been impacted by the release of chlorinated solvents originating from the sources associated with IRP Site 24.

A Technical Memorandum was prepared by the DON (NAVFAC SW 1998) that presented a sampling strategy to ascertain whether a release of chemicals of potential concern associated with photographic processing activities at the site had occurred. The chemicals of concern identified in the Technical Memorandum included silver, iron, copper, hydroquinone, glycols, ethylene diethyl, organic nitrogen compounds, ammonia, and cyanides. However, there are no records that an investigation took place.

2. Issues and Concerns

The following issues and concerns associated with this PRL were identified during the records review, previous investigations and visual site inspections conducted in 2002 in support of the 2003 Environmental Baseline Survey (NAVFAC SW 2003), and in 2004 as part of the supplemental site reconnaissance:

- Chemicals of concern from photographic processing activities may have been released to the environment via the floor drains and sewer lines. Further investigation was recommended.

A sampling program was proposed to further investigate the issues identified and assess whether a release of hazardous substances or pollutants has occurred to the environment. A summary of soil sampling activities is presented in Section 3, and the results are presented in Section 4.

3. Sampling and Analysis Summary

Sampling to evaluate PRL 312 was conducted in June 2005. The sample locations are shown on Figure 2, and a summary of sampling and analyses performed is provided in Table 1.

Nine soil samples were collected at locations HA1, through HA9, to assess for releases of chemicals of potential concern associated with photographic processes via the floor drains and industrial (acid) waste line connections. The samples were collected 1 foot below the sewer inverts using hand auger equipment and analyzed for the following photographic operations-related substances: silver, copper, hydroquinone, and cyanides. These analytes were selected from the list presented in the 1998 Technical Memorandum as those that would most likely indicate if a release has occurred (i.e., those that have lower preliminary remediation goals [PRGs] would likely have been released in larger quantities, and would have been less likely to breakdown or degrade over time).

4. Investigation Results

This section presents analytical results and discusses the results of data evaluation and risk screening.

4.1 ANALYTICAL RESULTS AND QUALITY ASSURANCE

The analytical results for the samples collected at PRL 312 along with the United States Environmental Protection Agency (EPA) Region 9 or California-modified residential PRGs are presented in Table 2 (EPA 2004a). Appendix A presents the validated laboratory analytical data and Appendix B presents the land surveying data.

4.2 RESULTS EVALUATION AND RISK SCREENING

Cyanide and hydroquinone were not detected above the laboratory reporting limits in any of the samples. Copper and silver did not exceed their respective residential PRGs (EPA 2004a), although a few exceedances above the former MCAS El Toro background values (Bechtel National, Inc. [BNI] 1996) were measured.

Risk screening was performed to evaluate risks associated with potential exposures to detected analytes in the soil at PRL 312. The methodology for risk screening is presented in Section 3.3 of the main text of the Summary Report, and results are presented in Table 3.

The cumulative maximum noncancer hazard associated with potential exposure to maximum detected concentrations of metals is expressed as a hazard index (HI) of $7.8E-03$, which is below the target HI of 1.

5. Conclusions and Recommendations

The primary objective of investigations conducted at PRL 312 was to assess whether a release of hazardous substances or pollutants into the environment has occurred. A review of available records, visual site inspections, and soil sampling analytical data indicates that no significant release of hazardous substances or pollutants has occurred at PRL 312. The reported concentrations of all chemicals of potential concern were less than their residential PRGs, and are not indicative of a significant release. Additionally, the noncancer hazard at this PRL is less than the target HI of 1. Based on these observations and results, no further investigation is recommended for PRL 312.

6. References

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Tables

Table 1: Sampling and Analyses Summary – PRL 312

Analytical Group and Method ^a	Sample Location	HA1	HA2	HA3	HA4	HA5	HA6	HA7	HA8	HA9
	EPA ID	LJ621	LJ622	LJ623	LJ652	LJ628	LJ624	LJ625	LJ626	LJ627
	Sample Depth (feet bgs)	1.9-2.5	1.5-2	2.2-2.9	1.5-2	2.7	2.2-2.8	1.2-1.4	2.3-2.5	2.3-2.8
	Sampling Technique	HA	HA	HA	HA	HA	HA	HA	HA	HA
Copper 6010B		X	X	X	X	X	X	X	X	X
Silver 6010B		X	X	X	X	X	X	X	X	X
Hydroquinone 8315A		X	X	X	X	X	X	X	X	X
Cyanide 9010B		X	X	X	X	X	X	X	X	X

Notes:

^a Analysis was in general accordance with the listed methods provided in EPA Publication SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.

bgs = below ground surface

EPA = Environmental Protection Agency

HA = hand auger

ID = identification

PRL = potential release location

X = analysis was performed for the specified analyte

Table 2: Analytical Results Summary - PRL 312

Analyte	MCAS El Toro Background Concentrations (95th Quantile) ^a	Residential Soil PRG ^b	Sample Location	PRL 312-HA1	PRL 312-HA2	PRL 312-HA3	PRL 312-HA4	PRL 312-HA5	PRL 312-HA6	PRL 312-HA7	PRL 312-HA8	PRL 312-HA9
			Sample Depth	1.9-2.5 feet bgs	1.5-2 feet bgs	2.2-2.9 feet bgs	1.5-2 feet bgs	2.7 feet bgs	2.2-2.8 feet bgs	1.2-1.4 feet bgs	2.3-2.5 feet bgs	2.3-2.8 feet bgs
			EPA ID	LJ621	LJ622	LJ623	LJ652	LJ628	LJ624	LJ625	LJ626	LJ627
Metals (mg/kg)												
Copper	10.5	3,129		6	10.1	6.1	10.6	9.7	8.6	12.4	6.9	8.5
Silver	0.539	391		0.53U	0.56U	0.53U	0.97	0.22	0.57U	0.11UJ	1.5	0.53U

Notes:

Concentrations in **bold font** indicate values greater than the former MCAS El Toro background values, but less than the residential soil PRGs

^a Source: BNI 1996

^b Analytical results were compared to EPA Region 9 PRGs (2004a)

bgs = below ground surface

BNI = Bechtel National, Inc.

EPA = Environmental Protection Agency

ID = identification

J = indicates an estimated value

MCAS = Marine Corps Air Station

mg/kg = milligrams per kilogram

PRG = preliminary remediation goal

PRL = potential release location

U = indicates the compound or analyte was analyzed for but was not detected at or above the stated limit

UJ = indicates the compound or analyte was analyzed for but was not detected; the sample detection limit is an estimated value

ET: 0048-0068-0008

Table 3: Risk Screening Results - PRL 312

COPC	MCAS El Toro Background Concentrations (95th Quantile) ^a	Maximum EPC	Carcinogenic PRG ^b	Noncarcinogenic PRG ^b	Risk Corresponding to Maximum EPC			
					Carcinogenic		Noncarcinogenic	
					Excess Cancer Risk ^c	Percent Contribution to Cancer Risk ^d	HI ^e	Percent Contribution to Noncancer Risk ^d
Metals (mg/kg)								
Copper	10.5	12.4	--	3.1E+03	--	--	4.0E-03	50.8%
Silver	0.539	1.5	--	3.9E+02	--	--	3.8E-03	49.2%
Cumulative Maximum Risk					0.0E+00	7.8E-03		

Notes:

^a Source: BNI 1996^b U.S. EPA Region 9 PRGs (2004a)^c Excess cancer risk = $1E-06 \times (\text{Maximum EPC/Carcinogenic PRG})$ ^d With respect to cumulative excess cancer risk or hazard index^e HI = Maximum EPC / Noncarcinogenic PRG

-- = value does not exist

BNI = Bechtel National, Inc.

COPC = constituent of potential concern

EPC = exposure point concentration

HI = hazard index

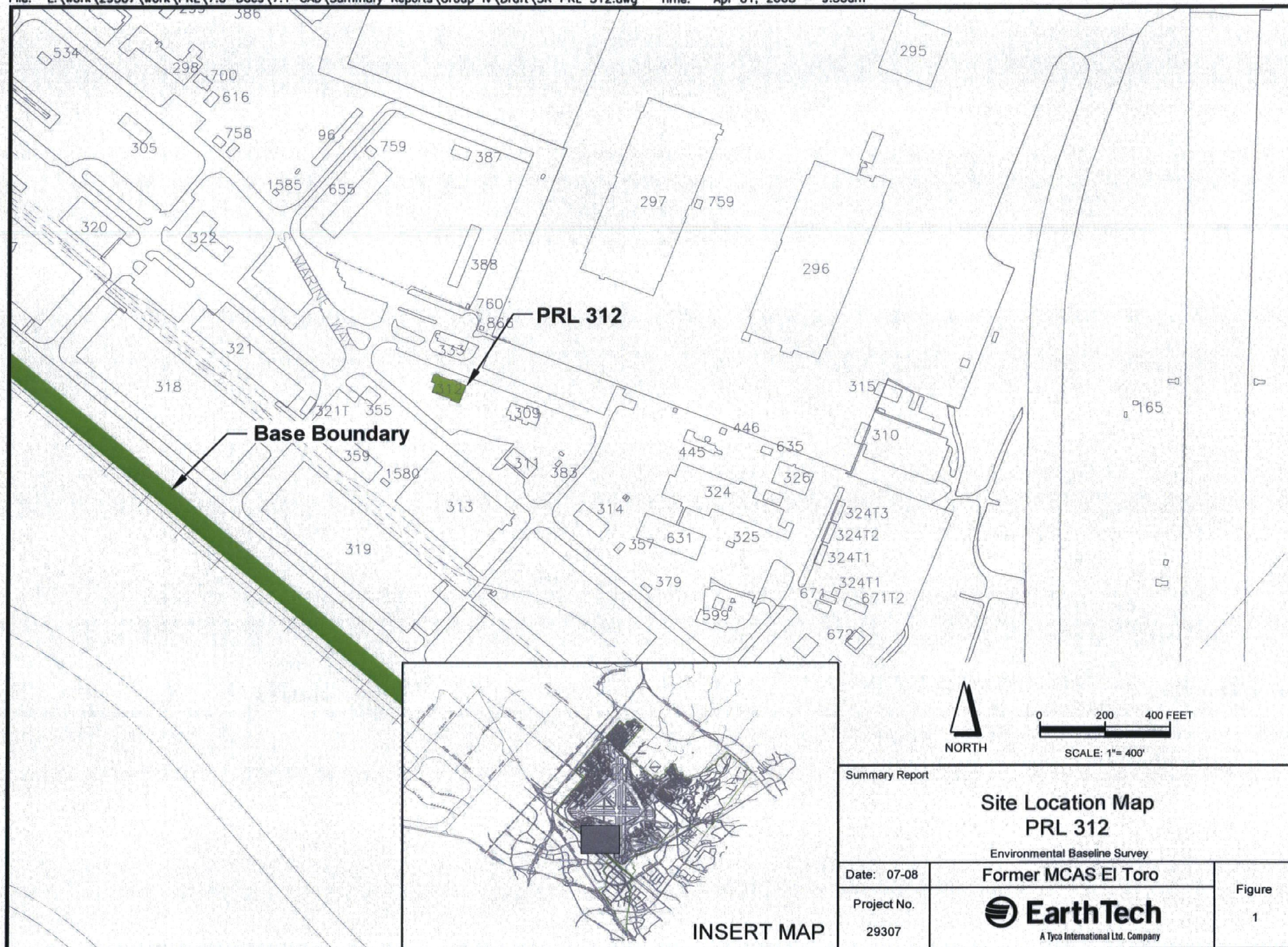
MCAS = Marine Corps Air Station

mg/kg = milligrams per kilogram

PRG = preliminary remediation goal

PRL = potential release location

Figures



Summary Report

Site Location Map PRL 312

Environmental Baseline Survey

Date: 07-08

Former MCAS El Toro

Project No.

29307

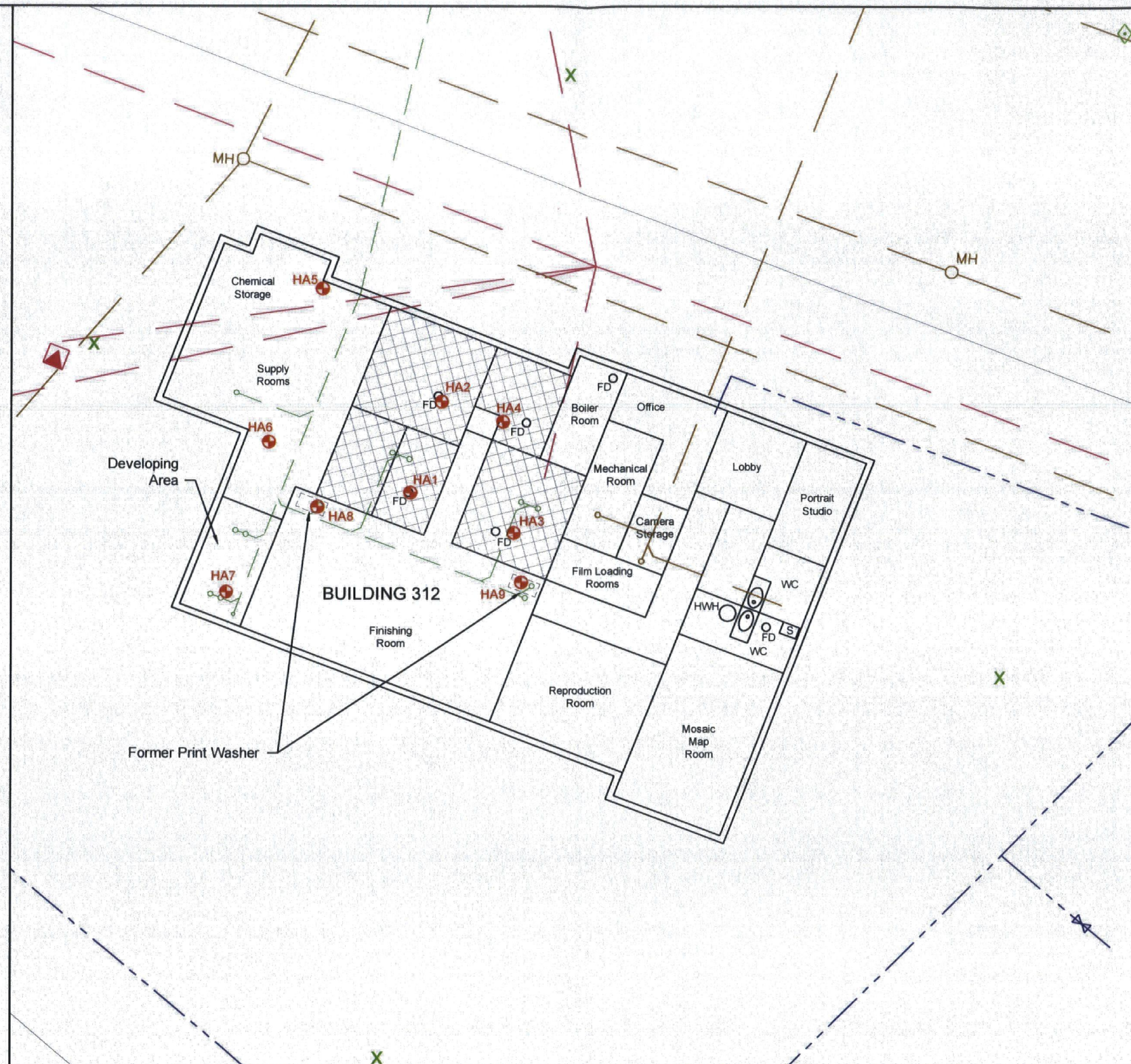
EarthTech
A Tyco International Ltd. Company

Figure

1



Exterior View of Building 312
(Facing Southeast)



LEGEND:

- Sanitary Sewer
- - - Water Line
- - - Electrical Line
- - - Industrial Waste Line (Acid)

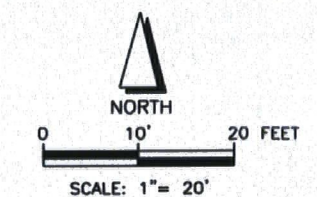
Dark Room Area
(Printing and Enlarging)

- HWH Hot Water Heater
- FD Floor Drain
- S Sink
- MH Manhole
- Transformer
- Water Valve
- WC Restroom

Approximate Phase I RI Soil Gas Location
(Bechtel, 1997) (Sample Depth: 30 ft bgs;
Analytes: VOCs and TPH)

Approximate Phase II RI CPT Adjacent to Soil
Gas Sample Location, Symbol Implies Nearby
24SG1 Soil Gas Sample Location (Bechtel, 1997)
(Sample Depth: 30 ft bgs to Groundwater;
Lithology Only)

HA1 Soil Sample Location (Earth Tech, 2005)
(Sample Depth: 1.2 to 2.8 ft bgs; Analytes:
Copper, Silver, Hydroquinone, and Cyanide)



Note: Features and interior layout are approximate and
may not be to scale

Summary Report

**Site Plan
PRL 312**

Environmental Baseline Survey

Date: 07-08

Former MCAS El Toro

Project No.

29307

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Figure

2

Appendix A
Validated Laboratory Analytical Data

Validated Analytical Data for PRL 312

		EPA ID:	LJ621	LJ622	LJ623	LJ652	LJ628	LJ624	LJ625	LJ626	LJ627
		Location ID:	PRL312-HA1	PRL312-HA2	PRL312-HA3	PRL312-HA4	PRL312-HA5	PRL312-HA6	PRL312-HA7	PRL312-HA8	PRL312-HA9
		Sample Type:	SS	SS	SS	SS	SS	SS	SS	SS	SS
		Sample Depth (feet bgs):	1.9-2.5	1.5-2	2.2-2.9	1.5-2	2.7	2.2-2.8	1.2-1.4	2.3-2.5	2.3-2.8
		Sample Date:	07-Jun-05	07-Jun-05	07-Jun-05	08-Jun-05	07-Jun-05	07-Jun-05	07-Jun-05	07-Jun-05	07-Jun-05
Parameter	Units	Analytical Method ¹									
Metals											
Copper	mg/kg	6010B	6	10.1	6.1	10.6	9.7	8.6	12.4	6.9	8.5
Silver	mg/kg	6010B	0.53U	0.56U	0.53U	0.97	0.22	0.57U	0.11UJ	1.5	0.53U
General Chemistry											
Cyanide	mg/kg	9010	2.6U	2.8U	2.7U	2.7U	2.8U	2.8U	2.6U	2.7U	2.7U
Hydroquinone	ug/kg	8315A	210U	230U	210U	430U	220U	230U	200U	210U	210U
Moisture	%	ASTM D 2216	5.5	11.3	6.5	7.9	9.6	12	2.1	6	6.5

Notes:

¹ = Environmental Protection Agency Method unless otherwise noted.

U = indicates the compound or analyte was analyzed for but was not detected at or above the stated limit.

J = indicates an estimated value

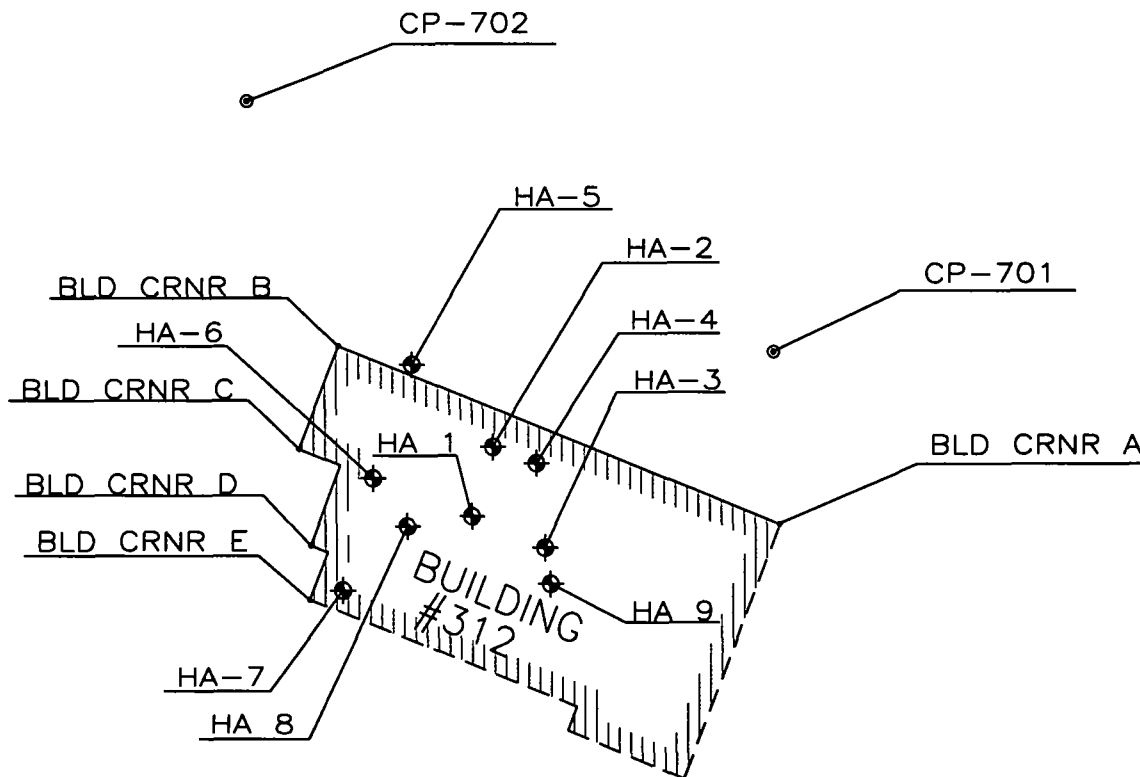
UJ = indicates the compound or analyte was analyzed for but was not detected. The sample detection limit is an estimated value.

ASTM = American Society of Testing and Materials

SS = Soil Sample

NA = not analyzed

Appendix B
Land Surveying Data



BUILDING #312 PRL AND NOTABLE FEATURES LOCATIONS

STATION	NORTHING	EASTING	ELEVATION
BLD CRNR A	2188175.239	6109205.306	
BLD CRNR B	2188213.174	6109107.980	
BLD CRNR C	2188191.161	6109099.294	
BLD CRNR D	2188170.682	6109101.774	
BLD CRNR E	2188159.108	6109101.537	
CP-701	2188212.027	6109204.163	275.92
CP-702	2188265.793	6109088.308	272.40
BLD 312-HA 1	2188176.797	6109137.464	276.73
BLD 312-HA 2	2188191.532	6109142.100	276.76
BLD 312-HA 3	2188170.163	6109153.604	276.74
BLD 312-HA 4	2188188.082	6109151.806	276.74
BLD 312-HA 5	2188209.217	6109124.239	276.33
BLD 312-HA 6	2188184.874	6109115.546	276.57
BLD 312-HA 7	2188161.014	6109108.794	276.59
BLD 312-HA 8	2188174.726	6109123.091	276.61
BLD 312-HA 9	2188162.468	6109154.829	276.61



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POTENTIAL RELEASE LOCATION SKETCH
BUILDING #312

SCALE: 1"=40' DATE: 07-01-05

BY: JCL JOB NO.: 04-1058-2227.000-535

Attachment 4
Summary Report
PRL 439



Summary Report for PRL 439, Environmental Baseline Survey

FORMER MARINE CORPS AIR STATION EL TORO, CALIFORNIA

July 2008

Prepared for:

**Base Realignment and Closure
Program Management Office West
San Diego, California**

Prepared by:

**Earth Tech, Inc.
841 Bishop Street, Suite 500
Honolulu, HI 96813-3920**

Prepared under:

**Naval Facilities Engineering Command
Contract Number N62742-94-D-0048
Contract Task Order 0068
DCN: ET-0048-0068-0008**

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A Drain Sampling Results	
B Validated Laboratory Analytical Data	
C Land Surveying Data	

ACRONYMS AND ABBREVIATIONS

µg/kg	micrograms per kilogram
µg/L	micrograms per liter
AST	aboveground storage tank
bgs	below ground surface
BNI	Bechtel National, Inc.
COPC	constituent of potential concern
EBS	environmental baseline survey
EPA	Environmental Protection Agency
EPC	exposure point concentration
HA	hand auger
HI	hazard index
ID	identification
J	indicates an estimated value
JS	jar sample
MCAS	Marine Corps Air Station
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NA	not analyzed
NAVFAC SW	Naval Facilities Engineering Command Southwest
PCB	polychlorinated biphenyl
pH	negative logarithm of hydrogen ion concentration
PRG	preliminary remediation goal
PRL	potential release location
SRU	silver recovery unit
SVOC	semivolatile organic compound
U	indicates the compound or analyte was analyzed for but was not detected at or above the stated limit
UJ	indicates the compound or analyte was analyzed for but was not detected; the sample detection limit is an estimated value
UST	underground storage tank
VOC	volatile organic compound

1. Background

Potential Release Location (PRL) 439 is associated with Building 439, situated in the northwest quadrant of former Marine Corps Air Station (MCAS) El Toro, California (Figure 1). Building 439 was listed as a Station Hospital in the 1958 Station list and as a Dispensary and Dental Clinic in the 1973 list. The last known description was Dental Clinic in the 1997 list. Figure 2 shows the plan of Building 439 and the surrounding area.

Four locations of concern were associated with this site. AST 439 was a 500-gallon, propane aboveground storage tank (AST), which has been removed and the site has been closed by the Regional Water Quality Control Board in a letter dated 28 August 2000. PCB T67 was a transformer containing polychlorinated biphenyls (PCBs) that was removed. The field survey conducted in 1994 indicated no evidence of a release, and no PCB releases were identified through the records search or the visual site inspections conducted in 2002 in support of the 2003 Environmental Baseline Survey (EBS) (Naval Facilities Engineering Command Southwest [NAVFAC SW] 2003). Therefore, no further action was recommended. UST 439A and UST 439B were 5,000-gallon, fuel-oil underground storage tanks (USTs), which have been removed and the sites have been closed by the Orange County Health Care Agency in a letter dated 12 September 1996.

2. Issues and Concerns

The following issues and concerns associated with PRL 439 were identified during the records review, previous investigations, and visual site inspection conducted in 2002 in support of the 2003 EBS (NAVFAC SW 2003):

- An x-ray room and film developing laboratory were identified during the 2003 EBS. SRU 01, a former silver recovery unit (SRU), was in operation at Building 439 until 1999. The presence of a film processing laboratory may have led to the release of photographic process chemicals and dissolved metals (i.e., silver from the SRU). Further investigation was recommended.
- The use of the facility as a hospital and dental clinic may have involved the use of thermometers and dental amalgam that may have resulted in discharges of mercury, silver, and other chemicals via sink or floor drains. The facility also contained an analytical laboratory and a sink with a biohazardous waste trap. Further investigation was recommended to assess whether hazardous substances were released into the environment via the building's plumbing system.

A sampling program was proposed to further investigate the issues identified and assess whether a release to the environment of hazardous substances or pollutants has occurred. A summary of soil sampling activities is presented in Section 3, and the results are presented in Section 4.

3. Sampling and Analysis Summary

Sampling to evaluate PRL 439 was conducted in January and February 2003. The sample locations are shown on Figure 2, and a summary of sampling and analysis is provided in Table 1.

Six soil samples (including a duplicate) were collected from four boreholes (HA1, HA2, HA3, and HA5) at depths ranging from 1-foot to 5.5 feet below ground surface (bgs). Samples were collected at HA1 and HA2, next to sewer line connections for the building, at a depth of 5.5 feet bgs. One soil sample and duplicate soil sample were collected at 2.0 feet bgs at location HA3, where the sink drain in the Dark Room goes beneath the slab. Two samples were collected next to the floor drain in the

Dark Room at location HA5 at depths of 1.5 and 2.0 feet bgs. The soil samples were collected using hand auger (HA) equipment and analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), metals, cyanide, and negative logarithm of hydrogen ion concentration (pH).

In addition, to evaluate constituents in the drains, solid (DS3, DS4, and DS6) and liquid (DS1, DS2, DS5, and DS7) samples were collected from seven sink p-traps at locations DS1 through DS7 and analyzed for metals. The analytical results for these drain samples are presented in Appendix A, and in the EBS (NAVFAC SW 2003). The results were compared to Federal and State waste characterization thresholds. This data should be taken into consideration during the proposed removal of the residuals in the drains.

4. Investigation Results

This section presents analytical results and discusses the results of data evaluation and risk screening.

4.1 ANALYTICAL RESULTS AND QUALITY ASSURANCE

The analytical results for the samples collected at PRL 439 along with the United States Environmental Protection Agency (EPA) Region 9 or California-modified residential preliminary remediation goals (PRGs) are presented in Table 2 (EPA 2004a). Appendix B presents the validated laboratory analytical data and Appendix C presents the land surveying data.

Some results were qualified as estimated in the data validation process. These qualifications do not affect the findings or conclusions of this report.

4.2 RESULTS EVALUATION AND RISK SCREENING

The pH values indicate that the soil is basic, and does not indicate that releases of acidic substances have occurred in the vicinity of the sampling locations.

Cyanide was not detected above the laboratory reporting limits. None of the reported VOCs (ethylbenzene, methylene chloride, toluene, and xylenes) or SVOCs (bis(2-ethylexyl)phthalate and butylbenzylphthalate) exceeded its residential PRGs (EPA 2004a). None of the metals, except arsenic, exceeded its respective residential PRGs, although some metal concentrations exceeding the former MCAS El Toro background values (Bechtel National, Inc. [BNI] 1996) were observed. Arsenic was reported at a maximum concentration of 4.0 milligrams per kilogram (mg/kg) at location HA1, which is greater than the California-modified residential PRG value of 0.06 mg/kg but less than the former MCAS El Toro background value of 6.86 mg/kg.

Risk screening was performed to evaluate risks associated with potential exposures to detected analytes in the soil at PRL 439. The methodology for risk screening is presented in Section 3.3 of the main text of the Summary Report, and results are presented in Table 3.

The cumulative maximum carcinogenic risk due to potential exposure to maximum detected concentrations of constituents of potential concern (COPCs) (detected analytes) at PRL 439 is 6.5E-05, which is less than the background risk of 1.1E-04. The maximum exposure point concentration (EPC) for arsenic of 4 mg/kg reported in the soil sample at location HA1 at 4.5 feet to 5.5 feet bgs accounts for about 99.5 percent of the cancer risk. However, this arsenic concentration is less than the former MCAS El Toro background value of 6.86 mg/kg. The cumulative maximum noncancer hazard associated with potential exposure to maximum detected concentrations of COPCs, expressed as the hazard index (HI), is 2.2, which is less than the background HI of 2.6. The maximum EPCs for

iron (18,400 mg/kg) and vanadium (40.2 mg/kg), detected in the duplicate soil sample at location HA3 at 1-foot to 2 feet bgs, account for about 35 percent and 23 percent of the noncancer HI, respectively. However, the EPCs for both iron and vanadium are less their respective former MCAS El Toro background values (18,400 mg/kg for iron and 71.8 mg/kg for vanadium) and their respective residential PRGs (23,463.18 mg/kg for iron and 78.21 mg/kg for vanadium).

5. Conclusions and Recommendations

The primary objective of investigations conducted at PRL 439 was to assess whether a release of hazardous substances or pollutants into the environment has occurred. A review of available records, visual site inspections, and soil sampling analytical data indicates that a significant release of hazardous substances or pollutants has not occurred to the environment at PRL 439. The reported concentrations of all COPCs were less than their respective residential PRGs (except arsenic), and are not indicative of a significant release. Arsenic was detected at a maximum concentration greater than the California-modified residential PRG, but less than the former MCAS El Toro background value. The resulting cumulative cancer risk and the noncancer hazard at PRL 439 is less than the background cancer risk and background noncancer hazard, respectively. Therefore, no further investigation is recommended for PRL 439.

6. References

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Tables

Table 1: Sampling and Analyses Summary – PRL 439

Sample Location	EPA ID	Sample Depth (feet bgs)	Sampling Technique	Analyte Group and Analytical Method ^a				
				VOCs 8260B	SVOCs 8270C	Metals 6010B & 7471A	Cyanide 9010B	pH 9045C
HA1	LJ154	4.5-5.5	HA	X	X	X	X	X
HA2	LJ155	5.5-5.5	HA	X	X	X	X	X
HA3	LJ185	1-2	HA	X	X	X	X	X
HA3*	LJ186	1-2	HA	X	X	X	X	X
HA5	LJ238	1.5	HA	X	X	X	X	X
HA5	LJ239	2	HA	X	X	X	X	X
DS1	LJ208	NA	JS	—	—	X	—	—
DS2	LJ241	NA	JS	—	—	X	—	—
DS3	LJ243	NA	JS	—	—	X	—	—
DS4	LJ209	NA	JS	—	—	X	—	—
DS5	LJ242	NA	JS	—	—	X	—	—
DS6	LJ236	NA	JS	—	—	X	—	—
DS7	LJ237	NA	JS	—	—	X	—	—

Notes:

^a Analysis was in general accordance with the listed methods provided in EPA Publication SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.

* Duplicate sample collected.

— = not analyzed

bgs = below ground surface

EPA = Environmental Protection Agency

HA = hand auger

ID = identification

JS = jar sample

NA = not applicable

pH = negative logarithm of hydrogen ion concentration

PRL = potential release location

SVOC = semivolatile organic compound

VOC = volatile organic compound

X = analysis was performed for the specified analyte

Table 2: Analytical Results Summary - PRL 439

Analyte	MCAS El Toro Background Value (95th quantile) ^a	Residential Soil PRG ^b	Sample Location	PRL439-HA1	PRL439-HA2	PRL439-HA3	PRL439-HA3 (dup)	PRL439-HA5	PRL439-HA5
			Sample Depth (feet bgs)	4.5-5.5	4.5-5.5	1.0-2.0	1.0-2.0	1.5	2
			EPA ID	LJ154	LJ155	LJ185	LJ186	LJ238	LJ239
Volatile Organic Compounds (µg/kg)									
Ethylbenzene	—	4.0E+05		5.1 U	5.4 U	5 U	5.8 U	1 J	634 J
Methylene Chloride	—	9.1E+03		3 J	5.4 U	0.5 J	0.6 J	0.6 J	0.8 J
Toluene	—	5.2E+05		5.1 U	5.4 U	5 U	5.8 U	4 J	561 J
Total Xylenes	—	2.7E+05		15 U	16 U	15 U	17 U	7 J	2,260 J
Semi-volatile Organic Compounds (µg/kg)									
Bis(2-ethylexy)phthalate	—	3.5E+04		550 U	11,000 U	550 U	630 U	1,110	7,600
Butylbenzylphthalate	—	1.2E+07		550 U	11,000 U	550 U	62 J	560 U	2,200 U
Metals (mg/kg)									
Aluminum	14,800	7.6E+04		<u>15,900</u>	11,000	7,420	<u>16,100</u>	12,400	9,560
Antimony	3.06	3.1E+01		13 U	13 U	13 U	15 U	13 U	13 U
Arsenic ^c	6.86	6.2E-02		<u>4.0</u>	<u>3.9</u>	2.1 UJ	3.2 UJ	4.4 UJ	3.8 UJ
Barium	173	5.4E+03		164	113	68.7	163	147	109
Berillium	0.669	1.5E+02		0.89 U	0.88 U	0.88 U	1 U	0.90 U	0.89 U
Cadmium	2.35	3.7E+01		0.7	0.39 UJ	0.14 UJ	0.44	0.69 UJ	0.36 UJ
Calcium	46,000	—		11,600	5,710	9,270	6,550	7,880	6,720
Chromium	26.9	2.1E+02		13.9	12.4	11.2	14.5	12.5	9.2
Cobalt	6.98	9.0E+02		6.3	5.5	<u>8.9</u>	<u>9.6</u>	<u>7.0</u>	<u>37.9</u>
Copper	10.5	3.1E+03		8	9.2	7.9	8.2	8.6	<u>29.8</u>
Iron	18,400	2.3E+04		16,400	14,900	12,700	18,400	15,800	12,900
Lead ^c	15.1	1.5E+02		3.1	8.3	7.7	4.2	3.9	4.8
Magnesium	8,370	—		8,150	5,100	3,940	7,270	6,870	5,040
Manganese	291	1.8E+03		233	207	160	<u>305</u>	247	192
Mercury	0.22	2.3E+01		0.22 U	0.22 U	0.044	0.11	0.0065 J	0.0077 J
Nickel	15.3	1.6E+03		9.2	9.5	6.5	9.3	9.3	10
Potassium	4,890	—		3,480 J	2,520 J	1,820	3,750	3,570	2,790
Selenium	0.32	3.9E+02		<u>0.59</u>	<u>0.57</u>	1.3 U	1.5 U	1.3 U	1.3 U
Silver	0.539	3.9E+02		2.2 U	2.2 U	<u>78.6</u>	<u>4.3</u>	2.2 U	0.78 UJ
Sodium	405	—		61.2 UJ	440 UJ	36.8 UJ	500 U	173 J	365
Thallium	0.42	5.2E+00	1.8 U	1.8 U	1.8 U	2 U	1.8 U	1.8 U	
Vanadium	71.8	7.8E+01	39.6	31.9	22.4	40.2	37.6	28.2	
Zinc	77.9	2.3E+04	47.9	53.6	47.5	55.1	45.2	43.8	
General Chemistry									
pH	—	—		8.26	7.16	7.78	8.15	8.57	9.39

Notes

Concentrations in **bold font** indicate values greater than the residential soil PRGs, but less than the MCAS El Toro background

Concentrations in italicized and underlined font indicate values greater than the former MCAS El Toro background values, but less than the residential soil PRGs

* Source: BNI 1996

^b Analytical results were compared to EPA Region 9 PRGs (2004a), with the exception of arsenic and lead (see note c)

^c Analytical results for arsenic and lead were compared to California-modified PRGs (2004a) because they are significantly more protective than the corresponding EPA Region 9 PRGs

— = value does not exist

µg/kg= micrograms per kilogram

bgs = below ground surface

BNI = Bechtel National, Inc.

EPA = Environmental Protection Agency

ID = identification

J = indicates an estimated value

MCAS = Marine Corps Air Station

mg/kg= milligrams per kilogram

NA = not analyzed

pH = negative logarithm of hydrogen ion concentration

PRG = preliminary remediation goal

PRL = potential release location

U= indicates the compound or analyte was analyzed for but was not detected at or above the stated limit

UJ= indicates the compound or analyte was analyzed for but was not detected; the sample detection limit is an estimated value

Table 3: Risk Screening Results - PRL 439

COPC	Maximum EPC	MCAS El Toro Background Value (95th quantile) ^a	Carcinogenic PRG ^b	Noncarcinogenic PRG ^b	Risk Corresponding to Maximum EPC				Risk Corresponding to Background			
					Carcinogenic		Noncarcinogenic		Carcinogenic		Noncarcinogenic	
					Excess Cancer Risk ^c	Percent Contribution to Cancer Risk ^d	HI ^e	Percent Contribution to Noncancer Risk ^d	Excess Cancer Risk ^f	Percent Contribution to Cancer Risk ^g	HI ^h	Percent Contribution to Noncancer Risk ^g
Volatile Organic Compounds (µg/kg)												
Ethylbenzene	634	--	--	1.9E+06	--	--	3.4E-04	0.0%	--	--	--	--
Methylene Chloride	3	--	9.1E+03	2.0E+06	3.3E-10	0.001%	1.5E-06	0.0%	--	--	--	--
Toluene	561	--	--	6.6E+05	--	--	8.6E-04	0.0%	--	--	--	--
Total Xylenes	2,260	--	--	2.7E+05	--	--	8.4E-03	0.4%	--	--	--	--
Semi-Volatile Organic Compounds (µg/kg)												
Bis(2-ethylhexyl)phthalate	7,600	--	3.5E+04	1.2E+06	2.2E-07	0.335%	6.2E-03	0.3%	--	--	--	--
Butylbenzylphthalate	62	--	--	1.2E+07	--	--	5.1E-06	0.0%	--	--	--	--
Metals (mg/kg)												
Aluminum	16,100	14,800	--	7.6E+04	--	--	2.1E-01	9.4%	--	--	1.9E-01	7.5%
Arsenic ⁱ	4	6.86	6.2E-02	2.2E+01	6.5E-05	99.494%	1.8E-01	8.2%	1.1E-04	99.9%	3.2E-01	12.2%
Barium	164	173	--	5.4E+03	--	--	3.1E-02	1.4%	--	--	3.2E-02	1.2%
Cadmium	0.7	2.35	1.4E+03	3.7E+01	5.0E-10	0.001%	1.9E-02	0.8%	1.7E-09	0.0%	6.3E-02	2.4%
Calcium	11,600	46,000	--	--	--	--	--	--	--	--	--	--
Chromium	14.5	26.9	2.1E+02	--	6.9E-08	0.105%	--	--	1.3E-07	0.1%	--	--
Cobalt	37.9	6.98	9.0E+02	1.4E+03	4.2E-08	0.064%	2.7E-02	1.2%	7.7E-09	0.0%	5.1E-03	0.2%
Copper	29.8	10.5	--	3.1E+03	--	--	9.5E-03	0.4%	--	--	3.4E-03	0.1%
Iron	18,400	18,400	--	2.3E+04	--	--	7.8E-01	35.0%	--	--	7.8E-01	30.1%
Lead ⁱ	8.3	15.1	--	1.5E+02	--	--	5.5E-02	2.5%	--	--	1.0E-01	3.9%
Magnesium	8,150	8,370	--	--	--	--	--	--	--	--	--	--
Manganese	305	291	--	1.8E+03	--	--	1.7E-01	7.7%	--	--	1.7E-01	6.3%
Mercury	0.11	0.22	--	2.3E+01	--	--	4.7E-03	0.2%	--	--	9.4E-03	0.4%
Nickel	10	15.3	--	1.6E+03	--	--	6.4E-03	0.3%	--	--	9.8E-03	0.4%
Potassium	3,750	4,890	--	--	--	--	--	--	--	--	--	--
Selenium	0.59	0.32	--	3.9E+02	--	--	1.5E-03	0.1%	--	--	8.2E-04	0.0%
Silver	78.6	0.539	--	3.9E+02	--	--	2.0E-01	9.0%	--	--	1.4E-03	0.1%
Sodium	365	405	--	--	--	--	--	--	--	--	--	--
Vanadium	40.2	71.8	--	7.8E+01	--	--	5.1E-01	22.9%	--	--	9.2E-01	35.2%
Zinc	55.1	77.9	--	2.3E+04	--	--	2.3E-03	0.1%	--	--	3.3E-03	0.1%
Cumulative Maximum Risk					6.5E-05		2.2E+00		1.1E-04		2.6E+00	

Notes:

^a Source: BNI 1996

^b United States EPA Region 9 PRGs (2004a)

^c Excess cancer risk = 1E-06 x (Maximum EPC/Carcinogenic PRG)

^d With respect to cumulative excess cancer risk or hazard index

^e HI = Maximum EPC / Noncarcinogenic PRG

^f Excess cancer risk = 1E-06 x (MCAS El Toro Background or Anthropogenic Concentration/Carcinogenic PRG)

^g With respect to cumulative excess cancer risk or hazard index

^h HI = MCAS El Toro Background or Anthropogenic Concentration / Noncarcinogenic PRG

ⁱ = Analytical results for arsenic and lead were compared to California-modified PRGs (2004a) because they are significantly more protective than the corresponding EPA Region 9 PRGs

-- = value does not exist

µg/kg= micrograms per kilogram

BNI = Bechtel National, Inc.

COPC = constituent of potential concern

EPA = Environmental Protection Agency

EPC = exposure point concentration

HI = hazard index

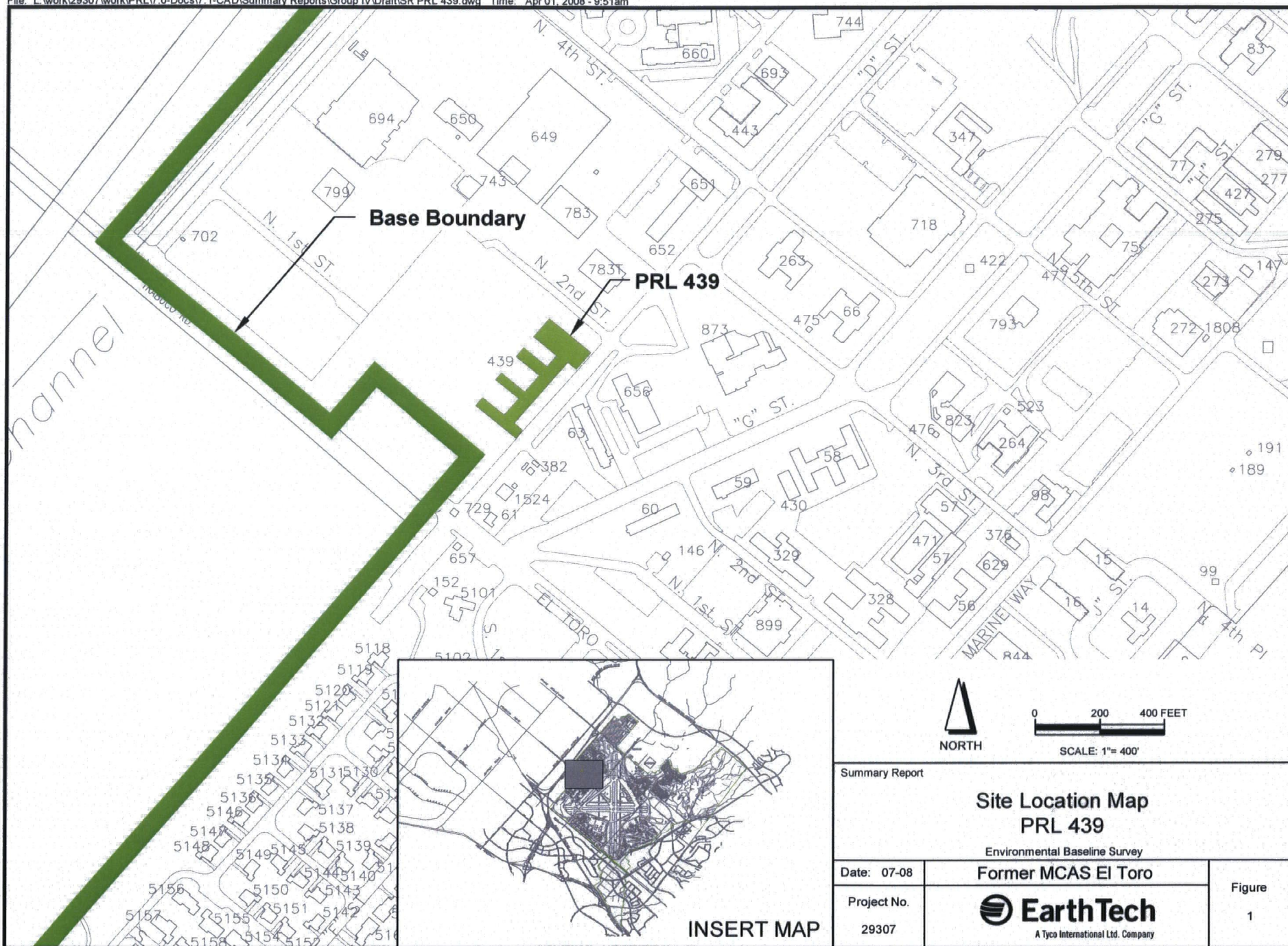
MCAS = Marine Corps Air Station

mg/kg= milligrams per kilogram

PRG = preliminary remediation goal

PRL = potential release location

Figures



Summary Report

Site Location Map PRL 439

Environmental Baseline Survey

Date: 07-08

Former MCAS El Toro

Project No.

29307

EarthTech
A Tyco International Ltd. Company

Figure

1

File: L:\work\29307\work\PR\7.0-Docs\7.1-CAD\Summary Reports\Group IV\Draft SR PRL 439.dwg Time: Apr 01, 2008 - 9:51am



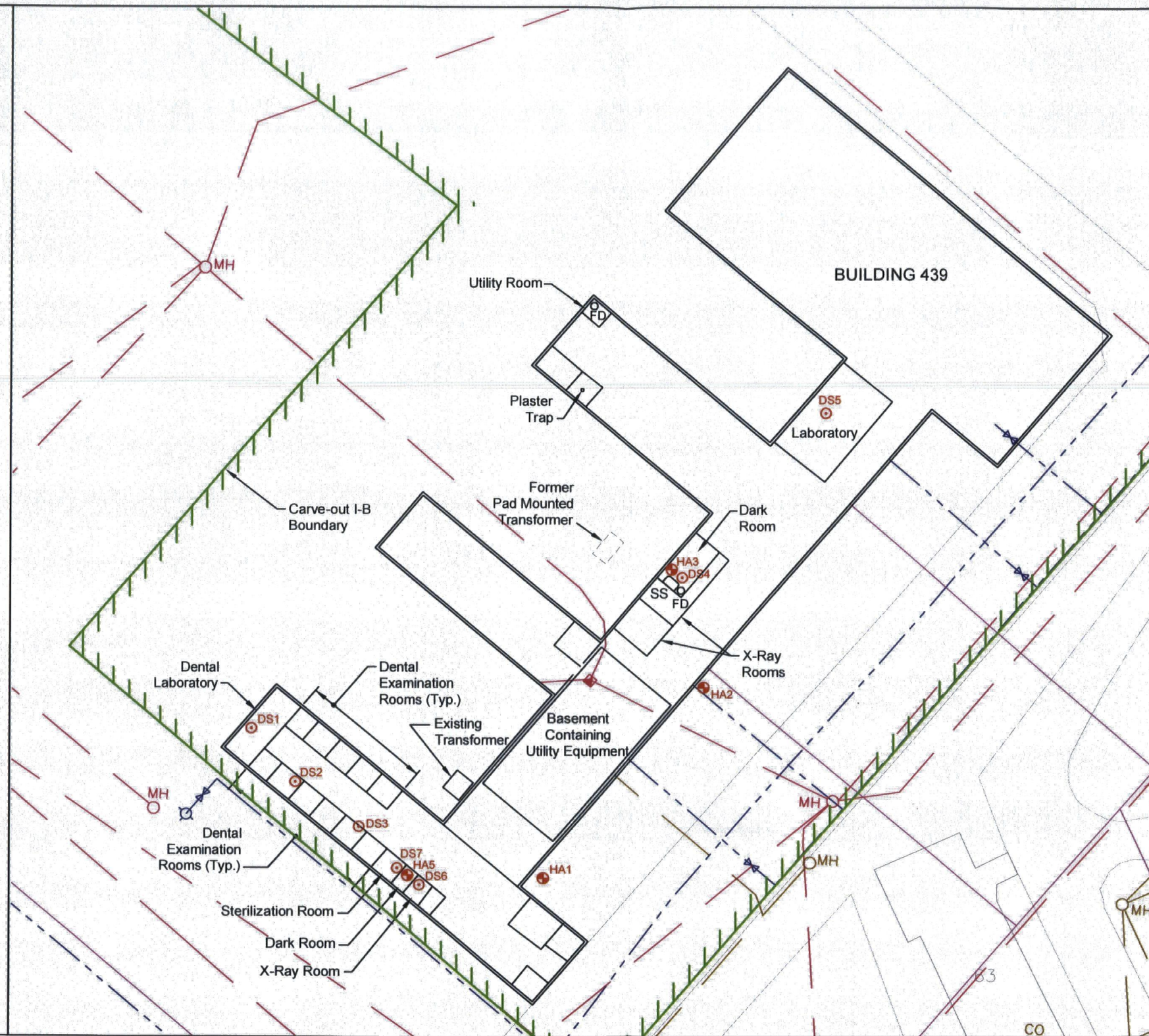
Dark Room with Floor Drain: Location of Soil Sample Borehole HA5. (Facing Northeast)



Dental Examination Room D113 Facing Northwest. Drain Sample DS2 Collected From Sink P-trap



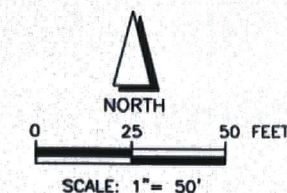
Service Sink in Dark Room. Location of Soil Sample Borehole HA3 and Drain Sample DS4 from Sink P-trap.



LEGEND:

- Sanitary Sewer
- Water Line
- Natural Gas Line
- Electrical Line
- Carve-out Boundary

- FD Floor Drain
- CO Clean Out
- MH Manhole
- SS Service Sink
- DS2 Drain Sample Location (Earth Tech, 2003) (Analytes: Metals)
- HA3 Soil Sample Location (Earth Tech, 2003) (Sample Depth: 1 to 5.5 ft bgs; Analytes: VOCs, SVOCs, Metals, Cyanide, and pH)



Note: Features and interior layout are approximate and may not be to scale

Summary Report

Site Plan PRL 439

Environmental Baseline Survey

Date: 07-08 Former MCAS El Toro

Project No. 29307

EarthTech
A Tyco International Ltd. Company

Figure
2

Appendix A
Drain Sampling Results

Table A-1: Analytical Results and Preliminary Waste Characterization, Sink Drain Samples (Solid Matrix), PRL 439

Analyte	RCRA Hazardous Waste		California Hazardous Waste			Sample Location	PRL439DS-3	PRL439-DS4	PRL439-DS6
	TCLP ^a (mg/L)	20 x TCLP ^b (mg/kg)	TTL ^c (mg/kg)	STLC ^d (mg/L)	10 x STLC ^e (mg/kg)	Sample Type	Solid Drain	Solid Drain	Solid Drain
						EPA ID	LJ243	LJ209	LJ236
Metals (mg/kg)									
Aluminum	--	--	--	--	--		274	3,720	2,240
Antimony	--	--	500	15	150		12 U	15.3	3.1 UJ
Arsenic	5	100	500	5	50		29.3	13.1	13.2
Barium	100	2,000	10,000	100	1,000		65	101	72.7
Berillium	--	--	75	1	8		0.8 U	0.8 U	0.35 UJ
Cadmium	1	20	100	1	10		<u>34.4</u>	<u>21.3</u>	4.7
Calcium	--	--	--	--	--		6,890	2,810	7,390
Chromium	5	100	500	5	50		927	<u>181</u>	3,130
Cobalt	--	--	8,000	80	800		<u>1,700</u>	16.4	19.5
Copper	--	--	2,500	25	250		62,400	29,400	16,600
Iron	--	--	--	--	--		114,000	179,000	28,300
Lead	5	100	1,000	5	50		47.8	2,150	3,190
Magnesium	--	--	--	--	--		113	715	705
Manganese	--	--	--	--	--		950	276	69.6
Mercury	0.2	4	20	0.2	2		53,400 J	30.6	29,100
Nickel	--	--	2,000	20	200		2,850	<u>264</u>	9,510
Potassium	--	--	--	--	--		81.3 UJ	310	203
Selenium	1	20	100	1	10		<u>14.6</u>	1.2 U	1.5 U
Silver	5	100	500	5	50		<u>127</u>	<u>134</u>	518
Sodium	--	--	--	--	--		400 U	953	1,870
Thallium	--	--	700	7	70		1.6 U	1.6 U	5.2
Vanadium	--	--	2,400	24	240		<u>581</u>	5	6.7
Zinc	--	--	5,000	250	2,500		16,300	40,500	11,600

Concentrations in **bold font** indicate values, greater than their respective TTLs, thereby classifying the material as California-regulated, non-RCRA hazardous waste.

These values also exceeded 20 times TCLP values, or 10 times STLCs.

Concentrations in italicized and underlined font indicate values greater than 10 times STLC or 20 times TCLP.

^a Maximum concentration (mg/L) of contaminants for the toxicity characteristic determined by the Toxicity Characteristic Leaching Procedure.

^b Correction factor for estimating whether the concentration in a solid may exceed the TCLP value.

^c Total threshold limit concentration (mg/kg) (California Code of Regulations Title 22).

^d Soluble Threshold Limit Concentration in milligrams per liter of waste extract determined using the Waste Extraction test (California Code of Regulations Title 22).

^e Correction factor for estimating whether the concentration in a solid may exceed the STLC.

-- = value does not exist

EPA = Environmental Protection Agency

ID = identification

J = indicates an estimated value

mg/kg = milligrams per kilogram

mg/L = milligrams per liter

PRL = potential release location

RCRA = Resource Conservation and Recovery Act

TCLP = toxicity characteristic leaching procedure


STLC = soluble threshold limit concentration

TTL = total threshold limit concentration

U = indicates the compound or analyte was analyzed for but was not detected at or above the stated limit

UJ = indicates the compound or analyte was analyzed for but was not detected; the sample detection limit is an estimated value

Table A-2: Analytical Results and Preliminary Waste Characterization, Sink Drain Samples (Liquid Matrix), PRL 439

Analyte	RCRA Hazardous Waste	California Hazardous Waste	Sample Location	PRL439-DS1	PRL439-DS7	PRL439-DS2	PRL439-DS5
	TCLP	WET	Sample Type	Liquid Drain	Liquid Drain	Liquid Drain	Liquid Drain
			EPA ID	LJ208	LJ237	LJ241	LJ242
Metals (µg/L)							
Aluminum	--	--		1,480	833	9,610	1,060
Antimony	--	15,000		10 U	50 U	10 U	26.5
Arsenic ^h	5,000	5,000		6.2 UJ	74.6	101	12.1
Barium	100,000	100,000		710	201	2,450	59.4
Berillium	--	750		1.4	10 U	50.1	2 U
Cadmium	1,000	1,000		2 U	266	44.5	13.6
Calcium	--	--		97,900	5,980	215,000	12,700
Chromium	5,000	5,000		39.8	643	578	24.3
Cobalt	--	80,000		25.6	5,070	162	33.1
Copper	--	25,000		6,920	<u>168,000</u>	<u>89,500</u>	4,650
Iron	--	--		4,230	2,260,000	33,500	25,000
Lead ^c	5,000	5,000		188	398	6,980	823
Magnesium	--	--		26,800	500 U	66,000	3,510
Manganese	--	--		41.2	12,100	296	293
Mercury	200	200		7,600	494	177,000 J	4.1 J
Nickel	--	20,000		<u>56,500</u>	<u>54,800</u>	3,520	5,800
Potassium	--	--		17,600	2,400 UJ	22,200	741 UJ
Selenium	1,000	1,000		10 U	108	31.4	10 U
Silver	5,000	5,000		6,410	40	1,610	926
Sodium	--	--		189,000	74,900	219,000	11,500
Thallium	--	7,000		13.3 UJ	50 U	48.5	11.9 UJ
Vanadium	--	24,000		4.7	249	22.8	24.6
Zinc	--	250,000		28,700	207,000	<u>438,000</u>	<u>288,000</u>

Notes

Concentrations in **bold font** indicate values, greater than its corresponding TCLP and STLC, thereby classifying the material as RCRA hazardous and California-regulated, non-RCRA hazardous waste

Concentrations in italicized and underlined font indicate values, greater than its corresponding STLC, thereby classifying the material as California-regulated, non-RCRA hazardous waste

-- = value does not exist

µg/L = micrograms per liter

EPA = Environmental Protection Agency

ID = identification

J = indicates an estimated value

PRL = potential release location

RCRA = Resource Conservation and Recovery Act

STLC = soluble threshold limit concentration

TCLP = toxicity characteristic leaching procedure

TTLC = total threshold limit concentration

U= indicates the compound or analyte was analyzed for but was not detected at or above the stated limit

UJ= indicates the compound or analyte was analyzed for but was not detected; the sample detection limit is an estimated value

Appendix B
Validated Laboratory Analytical Data Reports

Validated Analytical Data for PRL 439

		EPA ID:	LJ154	LJ155	LJ185	LJ186	LJ238	LJ239
		Location ID:	PRL439-HA1	PRL439-HA2	PRL439-HA3	PRL439-HA3 (dup)	PRL439-HA5	PRL439-HA5
		Sample Type:	SS	SS	SS	SS	SS	SS
		Sample Depth (feet bgs)	4.5-5.5	4.5-5.5	1.0-2.0	1.0-2.0	1.5	2
		Sample Date:	29-Jan-03	29-Jan-03	31-Jan-03	31-Jan-03	28-Feb-03	28-Feb-03
Parameter	Units	Analytical Method ¹						
Volatile Organic Compounds								
1,1,1,2-Tetrachloroethane	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
1,1,1-Trichloroethane	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
1,1,2,2-Tetrachloroethane	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
1,1,2-Trichloroethane	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
1,1,2-Trichlorotrifluoroethane	ug/kg	8260B	5.1 UJ	5.4 UJ	5 UJ	5.8 UJ	4.5 U	4.4 U
1,1-Dichloroethane	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
1,1-Dichloroethene	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
1,2-Dichloroethane	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
1,2-Dichloropropane	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
1,2-Dichlorotetrafluoroethane	ug/kg	8260B	5.1 UJ	5.4 UJ	5 UJ	5.8 UJ	4.5 U	4.4 U
2-Butanone	ug/kg	8260B	100 U	110 U	100 UJ	120 U	90 U	87 U
2-Hexanone	ug/kg	8260B	51 UJ	54 UJ	50 U	58 U	45 UJ	44 UJ
4-Methyl-2-pentanone	ug/kg	8260B	51 UJ	54 UJ	50 U	58 U	45 UJ	44 UJ
Acetone	ug/kg	8260B	100 U	110 U	100 UJ	120 UJ	90 U	87 U
Benzene	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
Bromodichloromethane	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
Bromoform	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
Bromomethane	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
Carbon Disulfide	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 UJ	4.5 U	4.4 U
Carbon Tetrachloride	ug/kg	8260B	5.1 UJ	5.4 UJ	5 UJ	5.8 UJ	4.5 UJ	4.4 UJ
Chlorobenzene	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
Chloroethane	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
Chloroform	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
Chloromethane	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
cis-1,2-Dichloroethene	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
cis-1,3-Dichloropropene	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
Dibromochloromethane	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
Dichlorodifluoromethane (Freon-12)	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
Di-isopropyl Ether (DIPE)	ug/kg	8260B	5.1 UJ	5.4 UJ	5 U	5.8 U	4.5 U	4.4 U
Ethyl tertiary butyl ether	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
Ethylbenzene	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	1 J	634 J
Methylene Chloride	ug/kg	8260B	3 J	5.4 U	0.5 J	0.6 J	0.6 J	0.8 J
Methyl-tert butyl ether (MTBE)	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
Styrene	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U

		EPA ID:	LJ154	LJ155	LJ185	LJ186	LJ238	LJ239
		Location ID:	PRL439-HA1	PRL439-HA2	PRL439-HA3	PRL439-HA3 (dup)	PRL439-HA5	PRL439-HA5
		Sample Type:	SS	SS	SS	SS	SS	SS
		Sample Depth (feet bgs)	4.5-5.5	4.5-5.5	1.0-2.0	1.0-2.0	1.5	2
		Sample Date:	29-Jan-03	29-Jan-03	31-Jan-03	31-Jan-03	28-Feb-03	28-Feb-03
Parameter	Units	Analytical Method ¹						
Tertiary amyl methyl ether	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
Tertiary Butyl Alcohol	ug/kg	8260B	21 UJ	22 UJ	20 UJ	23 UJ	18 UJ	17 UJ
Tetrachloroethene (PCE)	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
Toluene	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4 J	561 J
Total Xylenes	ug/kg	8260B	15 U	16 U	15 U	17 U	7 J	2260 J
Trans-1,2-Dichloroethene	ug/kg	8260B	5.1 UJ	5.4 UJ	5 U	5.8 U	4.5 U	4.4 U
Trans-1,3-Dichloropropene	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
Trichloroethene (TCE)	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
Trichlorofluoromethane (Freon-11)	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 UJ	4.4 UJ
Vinyl Chloride	ug/kg	8260B	5.1 U	5.4 U	5 U	5.8 U	4.5 U	4.4 U
Semi-Volatile Organic Compounds								
1,2,4-Trichlorobenzene	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
1,2-Dichlorobenzene	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
1,3-Dichlorobenzene	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
1,4-Dichlorobenzene	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
2,2'-Oxybis(1-chloropropane)	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
2,4,5-Trichlorophenol	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
2,4,6-Trichlorophenol	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
2,4-Dichlorophenol	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
2,4-Dimethylphenol	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
2,4-Dinitrophenol	ug/kg	8270C	2800 U	55000 U	2700 U	3100 U	2800 U	11000 U
2,4-Dinitrotoluene	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
2,6-Dinitrotoluene	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
2-Chloronaphthalene	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
2-Chlorophenol	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
2-Methylphenol	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
2-Nitroaniline	ug/kg	8270C	2800 U	55000 U	2700 U	3100 U	2800 U	11000 U
2-Nitrophenol	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
3,3'-Dichlorobenzidine	ug/kg	8270C	1100 U	22000 U	1100 U	1300 U	1100 U	4500 U
3/4-methylphenol	ug/kg	8270C	550 U	11000 U	550 U	630 U	2800 U	11000 U
3-Nitroaniline	ug/kg	8270C	2800 U	55000 U	2700 U	3100 U	2800 U	11000 U
4,6-Dinitro-2-methylphenol	ug/kg	8270C	2800 U	55000 U	2700 U	3100 U	560 U	2200 U
4-Bromophenyl-phenylether	ug/kg	8270C	550 UJ	11000 UJ	550 UJ	630 UJ	560 U	2200 U
4-Chloro-3-Methylphenol	ug/kg	8270C	550 U	11000 U	550 U	630 U	1100 U	4500 U
4-Chloroaniline	ug/kg	8270C	1100 U	22000 U	1100 U	1300 U	560 U	2200 U
4-Chlorophenyl-phenyl ether	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U

		EPA ID:	LJ154	LJ155	LJ185	LJ186	LJ238	LJ239
		Location ID:	PRL439-HA1	PRL439-HA2	PRL439-HA3	PRL439-HA3 (dup)	PRL439-HA5	PRL439-HA5
		Sample Type:	SS	SS	SS	SS	SS	SS
		Sample Depth (feet bgs)	4.5-5.5	4.5-5.5	1.0-2.0	1.0-2.0	1.5	2
		Sample Date:	29-Jan-03	29-Jan-03	31-Jan-03	31-Jan-03	28-Feb-03	28-Feb-03
Parameter	Units	Analytical Method ¹						
4-Nitroaniline	ug/kg	8270C	2800 U	55000 U	2700 U	3100 U	2800 U	11000 U
4-Nitrophenol	ug/kg	8270C	2800 UJ	55000 UJ	2700 UJ	3100 UJ	2800 U	11000 U
bis(2-chlorethoxy)methane	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
bis(2-chloroethyl)ether	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
bis(2-ethylhexyl)phthalate	ug/kg	8270C	550 U	11000 U	550 U	630 U	1110	7600
Butylbenzylphthalate	ug/kg	8270C	550 U	11000 U	550 U	62 J	560 U	2200 U
Carbazole	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
Dibenzofuran	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
Diethylphthalate	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
Dimethylphthalate	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
Di-n-butylphthalate	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
Di-n-octylphthalate	ug/kg	8270C	550 U	11000 UJ	550 U	630 U	560 U	2200 U
Hexachlorobenzene	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
Hexachlorobutadiene	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
Hexachlorocyclopentadiene	ug/kg	8270C	2800 U	55000 U	2700 U	3100 U	2800 U	11000 U
Hexachloroethane	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
Isophorone	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
Nitrobenzene	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
n-Nitrosodi-n-propylamine	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
n-Nitroso-diphenylamine	ug/kg	8270C	2800 U	55000 U	2700 U	3100 U	2800 U	11000 U
Pentachlorophenol	ug/kg	8270C	1900 U	37000 U	1900 U	2100 U	1900 U	7600 U
Phenol	ug/kg	8270C	550 U	11000 U	550 U	630 U	560 U	2200 U
Metals								
Aluminum	mg/kg	6010B	15900	11000	7420	16100	12400	9560
Antimony	mg/kg	6010B	13 U	13 U	13 U	15 U	13 U	13 U
Arsenic	mg/kg	6010B	4	3.9	2.1 UJ	3.2 UJ	4.4 UJ	3.8 UJ
Barium	mg/kg	6010B	164	113	68.7	163	147	109
Berillium	mg/kg	6010B	0.89 U	0.88 U	0.88 U	1 U	0.90 U	0.89 U
Cadmium	mg/kg	6010B	0.7	0.39 UJ	0.14 UJ	0.44	0.69 UJ	0.36 UJ
Calcium	mg/kg	6010B	11600	5710	9270	6550	7880	6720
Chromium	mg/kg	6010B	13.9	12.4	11.2	14.5	12.5	9.2
Cobalt	mg/kg	6010B	6.3	5.5	8.9	9.6	7.0	37.9
Copper	mg/kg	6010B	8	9.2	7.9	8.2	8.6	29.8
Iron	mg/kg	6010B	16400	14900	12700	18400	15800	12900
Lead	mg/kg	6010B	3.1	8.3	7.7	4.2	3.9	4.8
Magnesium	mg/kg	6010B	8150	5100	3940	7270	6870	5040

		EPA ID:	LJ154	LJ155	LJ185	LJ186	LJ238	LJ239
		Location ID:	PRL439-HA1	PRL439-HA2	PRL439-HA3	PRL439-HA3 (dup)	PRL439-HA5	PRL439-HA5
		Sample Type:	SS	SS	SS	SS	SS	SS
		Sample Depth (feet bgs)	4.5-5.5	4.5-5.5	1.0-2.0	1.0-2.0	1.5	2
		Sample Date:	29-Jan-03	29-Jan-03	31-Jan-03	31-Jan-03	28-Feb-03	28-Feb-03
Parameter	Units	Analytical Method ¹						
Manganese	mg/kg	6010B	233	207	160	305	247	192
Mercury	mg/kg	7471A	0.22 U	0.22 U	0.044	0.11	0.0065 J	0.0077 J
Nickel	mg/kg	6010B	9.2	9.5	6.5	9.3	9.3	10
Potassium	mg/kg	6010B	3480 J	2520 J	1820	3750	3570	2790
Selenium	mg/kg	6010B	0.59	0.57	1.3 U	1.5 U	1.3 U	1.3 U
Silver	mg/kg	6010B	2.2 U	2.2 U	78.6	4.3	2.2 U	0.78 UJ
Sodium	mg/kg	6010B	61.2 UJ	440 UJ	36.8 UJ	500 U	173 J	365
Thallium	mg/kg	6010B	1.8 U	1.8 U	1.8 U	2 U	1.8 U	1.8 U
Vanadium	mg/kg	6010B	39.6	31.9	22.4	40.2	37.6	28.2
Zinc	mg/kg	6010B	47.9	53.6	47.5	55.1	45.2	43.8
General Chemistry								
Cyanide (Total)	mg/kg	9010B	2.8 U	2.7 U	2.7 U	3.1 U	2.8 U	2.8 U
pH	pH	9045C	8.26	7.16	7.78	8.15	8.57	9.39

Notes:

¹ = Environmental Protection Agency Method unless otherwise noted.

U = indicates the compound or analyte was analyzed for but was not detected at or above the stated limit.

J = indicates an estimated value

UJ = indicates the compound or analyte was analyzed for but was not detected. The sample detection limit is an estimated value.

ASTM = American Society of Testing and Materials

SS = Soil Sample











Appendix C
Land Surveying Data

SITE PLAN

BORE HOLE LOCATIONS

PROJECT MCAS EL TORO PRL 439
ELTORO MARINE BASE EL TORO, CA

BORE HOLES				
POINT NUMBER	DESCRIPTION	NORTH	EAST	ELEVATION
345	PRL439-HA1	2195498.55	6107988.90	294.00
339	PRL439-HA2	2195576.88	6108051.13	292.93
338	PRL439-HA3	2195618.54	6108035.89	294.28

Legend			
AC	ASPHALT PAVING	●	MONITORING WELL
BH	BORE HOLE	○	SPARGE POINT
CLF	CHAIN LINK FENCE	⊙	VAPOR EXTRACTION
EB	ELECTRIC BOX	■	WELLS
EMB	ELECTRIC MAN HOLE	■	VAPOR EXTRACTION
EV	ELECTRIC VAULT	■	VALVES
FS	FINISH SURFACE	⊙	BORE HOLE
FR	FIRE RISER	TOR	TOP OF RM
GM	GAS METER	TOC	TOP OF CASING
GV	GAS VAULT	TC	TOP OF CURB
PHV	PHONE VAULT	FL	FLOW LINE
SCO	SEWER CLEAN OUT		RAILROAD TRACKS
SD	STORM DRAIN		PARKING LOT LIGHT
TV	TELEPHONE VAULT		WOOD FENCE
TMH	TELEPHONE MAN HOLE		CHAIN LINK FENCE
TOW	TOP OF WALL		CATCH BASIN
UB	UTILITY BOX		LANDSCAPE TREE
VLT	VAULT		CENTER LINE
WB	WATER BOX		PROPERTY LINE
WM	WATER METER		FIRE HYDRANT
WVS	WATER VALVES		LIGHT

PRL439-HA3

PRL439-HA2

PRL439-HA1

DATE OF SURVEY
FEBRUARY 10, 2003

BENCH MARK
THE ELEVATIONS SHOWN HEREON ARE BASED UPON ORANGE
COUNTY SURVEYORS MONUMENT NO. 32-113-90 ELEVATION =
413.237 FEET (NAVD83)

COORDINATES
THE COORDINATES SHOWN HEREON ARE BASED UPON THE STATE PLANE
COORDINATE SYSTEM (NAD83), CALIFORNIA ZONE VI.

PREPARED FOR
EARTH TECH
100 W. BROADWAY, SUITE 240
LONG BEACH, CA 90802
(562) 951-2057
(562) 951-2088 Fax

NO.	DATE	REVISIONS	BY
1	02-14-03	SUBMITTAL	HP/DG

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Attachment 5
Summary Report
PRL 457



**Summary Report for PRL 457,
Environmental Baseline Survey**

**FORMER MARINE CORPS AIR STATION
EL TORO, CALIFORNIA**

July 2008

Prepared for:

**Base Realignment and Closure
Program Management Office West
San Diego, California**

Prepared by:

**Earth Tech, Inc.
841 Bishop Street, Suite 500
Honolulu, HI 96813-3920**

Prepared under:

**Naval Facilities Engineering Command
Contract Number N62742-94-D-0048
Contract Task Order 0068
DCN: ET-0048-0068-0008**

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APPENDICES

A Drain Sampling Results	
B Validated Laboratory Analytical Data	
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ACRONYMS AND ABBREVIATIONS

APHO	aerial photograph anomaly
bgs	below ground surface
BNI	Bechtel National, Inc.
DTSC	Department of Toxic Substances Control
DON	Department of the Navy
EBS	environmental baseline survey
EPA	Environmental Protection Agency
HA	hand auger
HI	hazard index
ID	identification
J	indicates an estimated value
MCAS	Marine Corps Air Station
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NFA	no further action
NAVFAC SW	Naval Facilities Engineering Command Southwest
PCB	polychlorinated biphenyl
PRG	preliminary remediation goal
PRL	potential release location
RFA	Resource Conservation and Recovery Act Facility Assessment
SRU	silver recovery unit
U	indicates the compound or analyte was analyzed for but was not detected at or above the stated limit
UJ	indicates the compound or analyte was analyzed for but was not detected; the sample detection limit is an estimated value
UST	underground storage tank

1. Background

Potential Release Location (PRL) 457 is associated with Building 457, located in the southeast quadrant of former Marine Corps Air Station (MCAS) El Toro, California (Figure 1). The building was listed as an Administrative Office in the 1973 Station list and as a Barber Shop in the 1997 list. The last known description was a Barber Shop; a Branch Dental Clinic; an Enlisted Mess Hall; and Group Headquarters. An X-ray developing laboratory and dental exam rooms were observed during the visual site inspection conducted in support of the 2003 Environmental Baseline Survey (EBS) (Naval Facilities Engineering Command Southwest [NAVFAC SW] 2003). Figure 2 shows the plan of Building 457 and the surrounding area.

Six locations of concern were associated with this site. Aerial Photograph Anomaly (APHO) 42 consisted of stains and wet soil for which the Department of Toxic Substances Control (DTSC) and the Regional Water Quality Control Board have concurred with the Department of the Navy's (DON's) recommendation for no further action (NFA) in letters dated 27 March 2000 and 18 October 2000, respectively. APHO 95 consisted of stains and wet soil for which DTSC has concurred with the DON's recommendation for NFA in a letter dated 25 June 2003. PCB T74 was a transformer containing polychlorinated biphenyls (PCBs) that was replaced by a non-PCB transformer. Based on findings of the Resource Conservation and Recovery Act Facility Assessment (RFA), response action was required for releases of transformer oil containing PCBs at Building 457 and the site was labeled RFA 244 (also known as Solid Waste Management Unit/Area of Concern 244). Removal of PCB-impacted soils at RFA 244 was completed in 1997. DTSC concurred with the DON's recommendation for NFA for RFA 244 (PCB T74) in a letter dated 17 December 1998. UST 457 was a 2,000-gallon diesel underground storage tank (UST) that was removed and the site closed by the Orange County Health Care Agency in a letter dated 9 December 1996. SRU 3C was a silver recovery unit (SRU) in the X-ray developing laboratory in the dental clinic.

2. Issues and Concerns

The following issues and concerns associated with this PRL were identified during the records review, previous investigations, and visual site inspections conducted in 2002 in support of the 2003 EBS (NAVFAC SW 2003), and in 2004 as part of supplemental site reconnaissance:

- Due to the past use of the facility as a dental/medical clinic, X-ray/photographic development chemicals, dental amalgam, or mercury from thermometers may have been released to the sanitary sewer and the environment via the sink drains and the SRU. Further evaluation was recommended to assess whether releases of pollutants into the environment have occurred as a result of past operations at this facility.

A sampling program was proposed to further investigate the issues identified and assess whether hazardous substances or pollutants have been released to the environment. A summary of soil sampling activities is presented in Section 3, and the results are presented in Section 4.

3. Sampling and Analysis Summary

Sampling to evaluate PRL 457 was conducted in May 2005. The sample locations are shown on Figure 2, and a summary of sampling and analyses is provided in Table 1.

One soil sample was collected at location HA1, adjacent to where the drain pipe connected to the SRU goes below ground to assess the soil for X-ray and dental-laboratory-related substances. The sample was collected 3 feet below ground surface (bgs) by hand auger (HA) and analyzed for copper, mercury, silver, and tin.

One soil sample was collected at location HA2 adjacent to the nearest connection of the sanitary sewer pipe to the building to assess the soil for X-Ray and dental-laboratory-related substances. The sample was collected 3 feet bgs by HA and analyzed for copper, mercury, silver, and tin.

In addition, to evaluate constituents in the drains, five solid samples (DS1A, DS1B, DS2, DS3, and DS4) were also collected and analyzed for copper, mercury, silver, and tin. The analytical results for these drain samples are presented in Appendix A. However, the p-traps and SRU were emptied of all loose material during sampling of the sink drains; therefore, no further action is required.

4. Investigation Results

This section presents analytical results and discusses the results of data evaluation and risk screening.

4.1 ANALYTICAL RESULTS AND QUALITY ASSURANCE

The analytical results for the samples collected at PRL 457 along with the United States Environmental Protection Agency (EPA) Region 9 or California-Modified residential preliminary remediation goals (PRGs) are presented in Table 2 (EPA Region 9 2004a). Appendix B presents the validated laboratory analytical data and Appendix C presents the land surveying data.

Some results were qualified as estimated in the data validation process. These qualifications do not affect the findings or conclusions of this report.

4.2 RESULTS EVALUATION AND RISK SCREENING

Concentrations of metals (copper, mercury, silver, and tin) in the soil samples collected at locations HA1 and HA2 did not exceed their respective residential PRGs (EPA 2004a) or former MCAS El Toro background values (Bechtel National, Inc. [BNI] 1996) (see Table 2).

Risk screening was performed to evaluate risks associated with potential exposures to detected analytes in the soil at PRL 457. The methodology for risk screening is presented in Section 3.3 of the main text of the Summary Report, and results are presented in Table 3.

The cumulative maximum noncancer hazard associated with potential exposure to maximum detected concentrations of chemicals is expressed as hazard index (HI) of 4.0E-03, which is below the target HI of 1.

5. Conclusions and Recommendations

The primary objective of investigations conducted at PRL 457 was to assess whether a release of hazardous substances or pollutants into the environment has occurred. A review of available records, visual site inspections, and soil sampling analytical data indicates that no release of hazardous substances or pollutants has occurred at PRL 457. The detected concentrations of the metals in the soil samples collected near the sanitary pipes were less than their respective residential PRGs and former MCAS El Toro background values, and are not indicative of a release of metals to the soil via the sewer system. Additionally, the noncancer hazard at this PRL is less than the target HI of 1. Based on these observations and results, no further investigation is recommended for PRL 457.

6. References

Bechtel National, Inc. 1996. *Final Technical Memorandum, Background and Reference Levels, Remedial Investigations, Marine Corps Air Station El Toro, California*. San Diego, CA: NAVFAC EFD SOUTHWEST.

Environmental Protection Agency, United States (EPA). 2004a. EPA Region 9 PRGs [Preliminary Remediation Goals] Tables. San Francisco, CA. October.

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Naval Facilities Engineering Command Southwest (NAVFAC SW). 1993. *Marine Corps Air Station El Toro, CA, Installation Restoration Program, Final Resource Conservation Recovery Act (RCRA), Facility Assessment Report, Volume I*. San Diego, CA. July.

_____. 2003. *Final Environmental Baseline Survey, Former Marine Corps Air Station, El Toro, California*. San Diego, CA. September.

Tables

Table 1: Sampling and Analyses Summary – PRL 457

Analytical Group and Method ^a	Sample Location	HA1	HA2	DS1A (p-trap)	DS1B (SRU)	DS2	DS3	DS4
	EPA ID	LJ571	LJ559	LJ611	LJ612	LJ613	LJ614	LJ615
	Sample Depth (feet bgs)	3	3	—	—	—	—	—
	Sampling Technique	HA	HA	JS	JS	JS	JS	JS
Copper 6010B		X	X	X	X	X	X	X
Mercury 7471A		X	X	X	X	X	X	X
Silver 6010B		X	X	X	X	X	X	X
Tin 6010B		X	X	X	X	X	X	X

Notes:

^a Analysis was in general accordance with the listed methods provided in EPA Publication SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.

— = not analyzed

bgs = below ground surface

EPA = Environmental Protection Agency

HA = hand auger

ID = identification

JS = jar sample

PRL = potential release location

X = analysis was performed for the specified analyte

Table 2: Analytical Results Summary - PRL 457

Analyte	MCAS El Toro Background Concentrations (95th Quantile) ^a	Residential Soil PRG ^b	Sample Location	PRL 457- HA1	PRL 457-HA2
			Sample Depth	3 feet bgs	3 feet bgs
			EPA ID	LJ571	LJ559
Metals (mg/kg)					
Copper	10.5	3,129		3.3 UJ	8.2
Mercury	0.22	23		0.57 U	0.59 U
Silver	0.539	391		0.081 J	0.054 J
Tin	—	46,924		25.6 J	56.2 J

Notes:

^a Source: BNI, 1996

^b Analytical results were compared to EPA Region 9 PRGs (2004a)

— = value does not exist

bgs = below ground surface

BNI = Bechtel National, Inc.

EPA = Environmental Protection Agency

ID = identification

J = indicates an estimated value

MCAS = Marine Corps Air Station

mg/kg = milligrams per kilogram

PRG = preliminary remediation goal

PRL = potential release location

U= indicates the compound or analyte was analyzed for but was not detected at or above the stated limit

UJ= indicates the compound or analyte was analyzed for but was not detected; the sample detection limit is an estimated value

Table 3: Risk Screening Results - PRL 457

COPC	MCAS El Toro Background Concentrations (95th Quantile) ^a	Maximum EPC	Carcinogenic PRG ^b	Noncarcinogenic PRG ^b	Risk Corresponding to Maximum EPC			
					Carcinogenic		Noncarcinogenic	
					Excess Cancer Risk ^c	Percent Contribution to Cancer Risk ^d	HI ^e	Percent Contribution to Noncancer Risk ^d
Metals (mg/kg)								
Copper	10.5	8.2	—	3.1E+03	—	—	2.6E-03	65.1%
Silver	0.539	0.081	—	3.9E+02	—	—	2.1E-04	5.1%
Tin	—	56.2	—	4.7E+04	—	—	1.2E-03	29.7%
Cumulative Maximum Risk					0.0E+00		4.0E-03	

Notes:

^a Source: BNI 1996

^b United States EPA Region 9 PRGs (2004a)

^c Excess cancer risk = $1E-06 \times (\text{Maximum EPC} / \text{Carcinogenic PRG})$

^d With respect to cumulative excess cancer risk or hazard index

^e HI = Maximum EPC / Noncarcinogenic PRG

— = value does not exist

BNI = Bechtel National, Inc.

COPC = constituent of potential concern

EPC = exposure point concentration

HI = hazard index

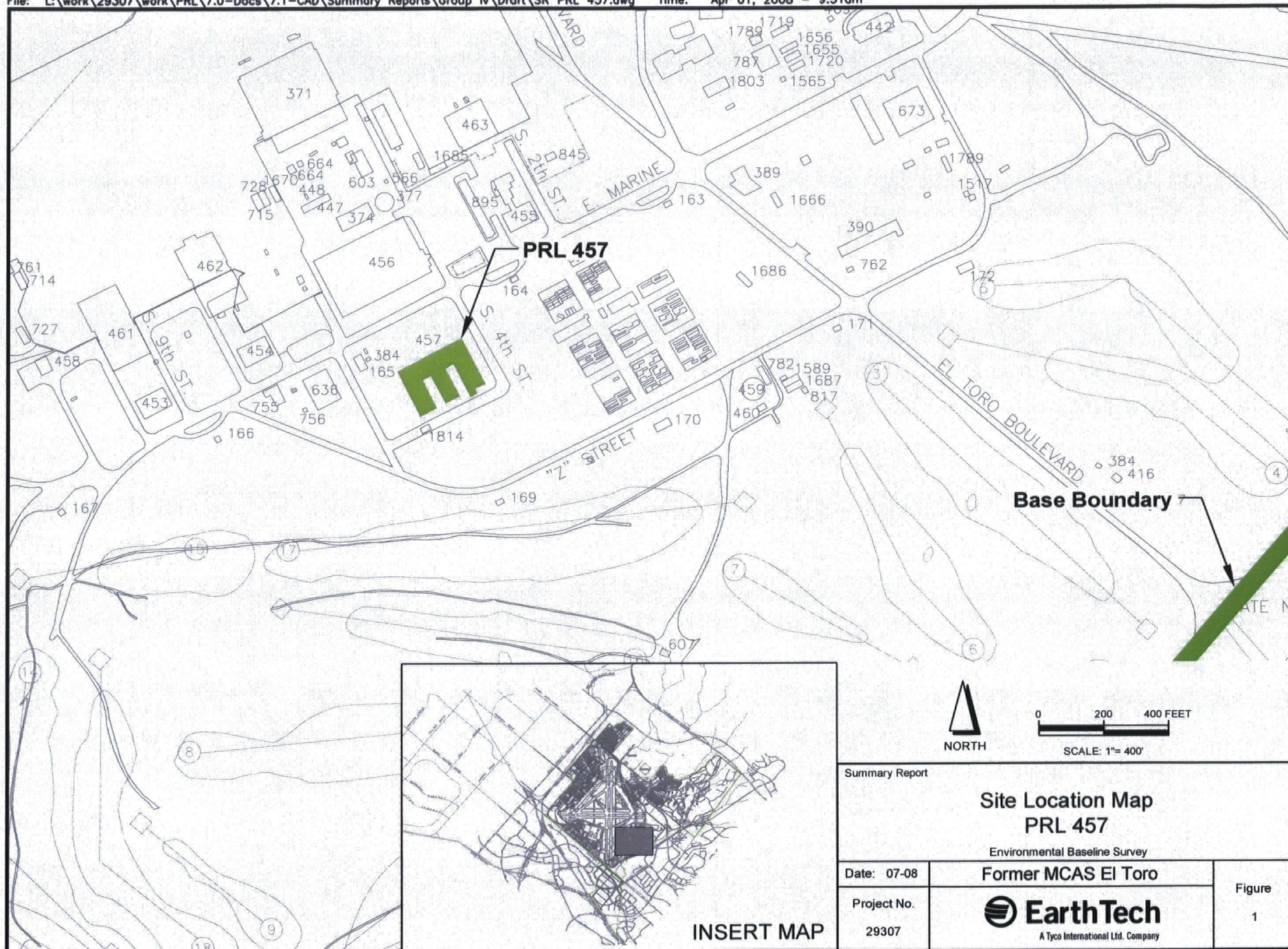
MCAS = Marine Corps Air Station

mg/kg = milligrams per kilogram

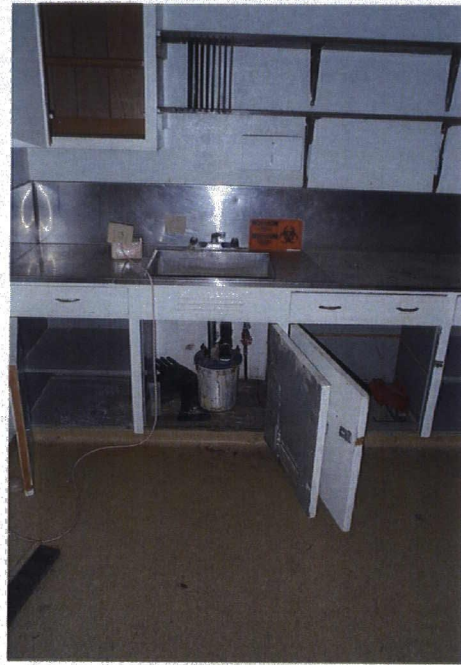
PRG = preliminary remediation goal

PRL = potential release location

Figures



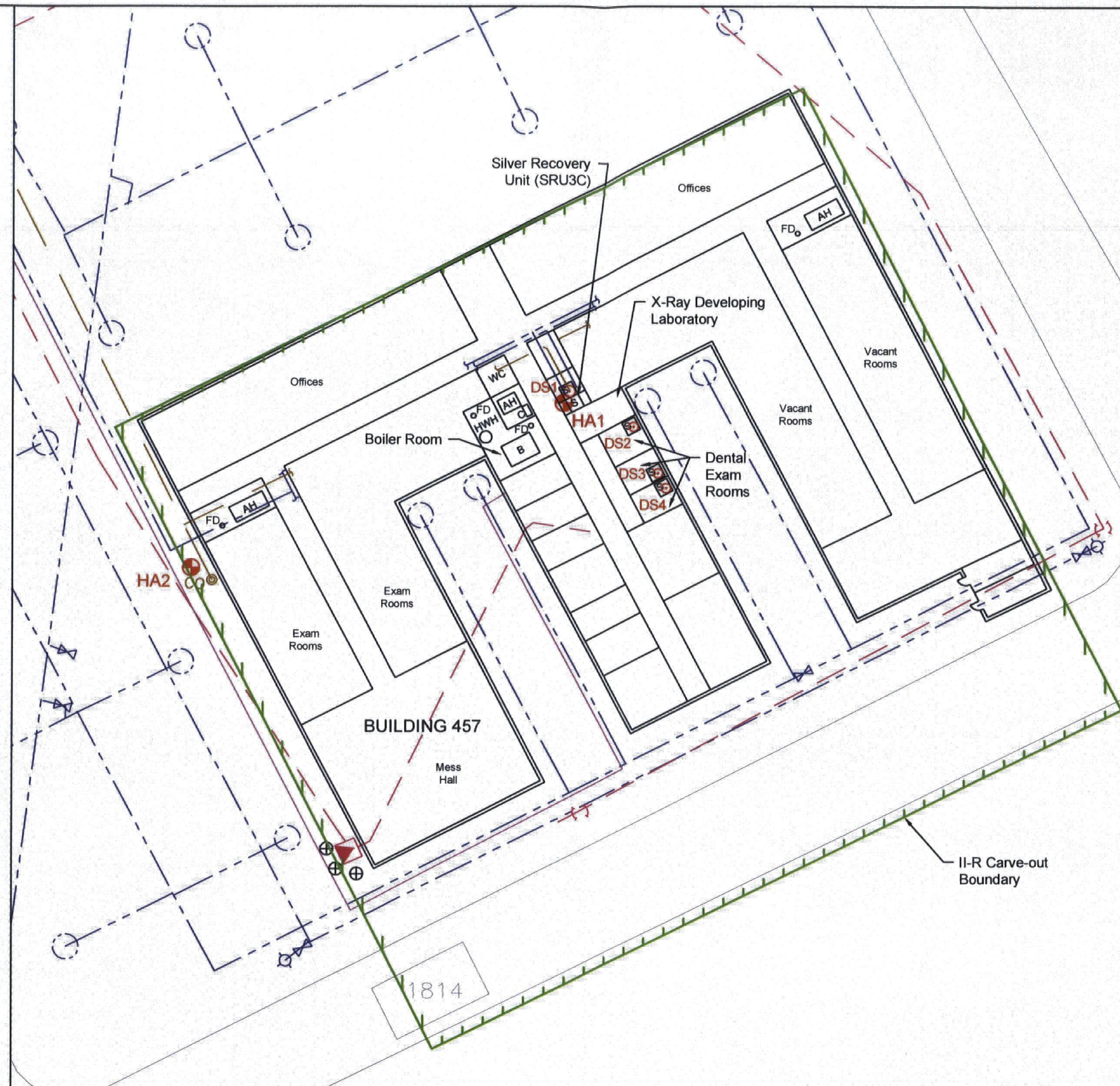
File: L:\work\29307\work\p\p\7.0-Docs\7.1-CAD\Summary Reports\Group I\Drawn\SR PRL 457.dwg Time: Apr 01, 2008 - 9:51am



Silver Recovery Unit (SRU3C) Below Sink
in X-Ray Developing Laboratory
(Facing Northwest)



Front of Building 457 Showing East
and Part of Central Wings
(Facing Northwest)



LEGEND:

- Sanitary Sewer
- Water Line
- Natural Gas Line
- Electrical Line
- Carve-out Boundary

- FD Floor Drain
- AH Air Heater
- B Boiler
- HWH Hot Water Heater
- C Compressor
- WC Restroom
- S Sink

- CO Clean Out

- Transformer

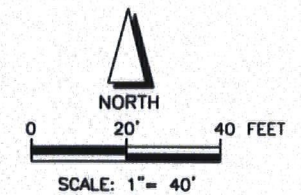
- Fire Hydrant

- Water Valve

- 1993 Soil Sample Location
(NAVFAC SW, 1993)
(Sample Depth: 2 to 5 ft bgs; Analytes: TPH,
VOCs, and PCBs)

- DS1 Drain Sample Location (Earth Tech, 2005)
Analytes: Copper, Mercury, Silver, and Tin

- HA2 Soil Sample Location (Earth Tech, 2005)
(Sample Depth: 3 ft bgs; Analytes: Copper,
Mercury, Silver, and Tin)



Note: Features and interior layout are approximate and
may not be to scale

Summary Report

**Site Plan
PRL 457**

Environmental Baseline Survey

Date: 07-08

Former MCAS EI Toro

Project No.
29307

EarthTech
A Tyco International Ltd. Company

Figure
2

Appendix A
Drain Sampling Results

Table A-1: Analytical Results and Preliminary Waste Characterization Summary, Sink Drain Samples, PRL 457

Analyte	RCRA Hazardous Waste		California Hazardous Waste			Sample Location	PRL 457-DS1A	PRL 457-DS1B	PRL 457-DS2	PRL 457-DS3	PRL 457-DS4
	TCLP ^a	20 x TCLP ^b	TTLC ^c	STLC ^d	10 x STLC ^e	Sample Type	Solid	Solid	Solid	Solid	Solid
	(mg/L)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	EPA ID	LJ611	LJ612	LJ613	LJ614	LJ615
Metals (mg/kg)											
Copper	--	--	2,500	25	250		219	37,400	55,000	68,900	123,000
Mercury	0.2	4	20	0.2	2		46.9	57.6	48.7	54	91.3
Silver	5	100	500	5	50		213	43,600	111,000	277,000	115,000
Tin	--	--	--	--	--		227 J	40,900 J	44,900 J	56,900 J	104,000 J

Notes:

Concentrations in **bold font** indicate values, greater than their respective TTLCs, thereby classifying the material as California-regulated, non-RCRA hazardous waste.

Concentrations in **bold, italicized, and underlined font** indicate values, greater than their respective TTLCs, thereby classifying the material as California-regulated, non-RCRA hazardous waste.

These values also exceeded 20 times TCLP values.

Concentrations in **italicized and underlined font** indicate values greater than its corresponding 20 times TCLP and 10 times STLC

^a Maximum concentration (mg/L) of contaminants for the toxicity characteristic determined by the Toxicity Characteristic Leaching Procedure.

^b Correction factor for estimating whether the concentration in a solid may exceed the TCLP value.

^c Total threshold limit concentration (mg/kg) (California Code of Regulations Title 22).

^d Soluble Threshold Limit Concentration in milligrams per liter of waste extract determined using the Waste Extraction test (California Code of Regulations Title 22).

^e Correction factor for estimating whether the concentration in a solid may exceed the STLC.

-- = value does not exist

EPA = Environmental Protection Agency

ID = identification

J = indicates an estimated value

mg/kg = milligrams per kilogram

mg/L = milligrams per liter

PRL = potential release location

RCRA = Resource Conservation and Recovery Act

STLC = soluble threshold limit concentration

TCLP = toxicity characteristic leaching procedure

TTLC = total threshold limit concentration

Appendix B
Validated Laboratory Analytical Data

Validated Analytical Data for PRL 457

		EPA ID:	LJ571	LJ559	LJ611	LJ612	LJ613	LJ614	LJ615
		Location ID:	PRL457-HA1	PRL457-HA2	PRL457-DS1(p-trap)	PRL457-DS1(SRU)	PRL457-DS2	PRL457-DS3	PRL457-DS4
		Sample Type:	SS	SS	SS	SS	SS	SS	SS
		Sample Depth (feet bgs):	3	3					
		Sample Date:	03-May-05	03-May-05	09-May-05	09-May-05	09-May-05	09-May-05	09-May-05
Parameter	Units	Analytical Method ¹							
Metals									
Copper	mg/kg	6010B	3.3 UJ	8.2	219	37400	55000	68900	123000
Silver	mg/kg	6010B	0.57 U	0.59 U	46.9	57.6	48.7	54	91.3
Mercury	mg/kg	7471A	0.081 J	0.054 J	213	43600	111000	277000	115000
Tin	mg/kg	6010B	25.6 J	56.2 J	227 J	40900 J	44900 J	56900 J	104000 J
Others									
Moisture	%	ASTM D 2216	12.6	15.2	NA	NA	NA	NA	NA

Notes:

¹ = Environmental Protection Agency Method unless otherwise noted.

U = indicates the compound or analyte was analyzed for but was not detected at or above the stated limit.

J = indicates an estimated value

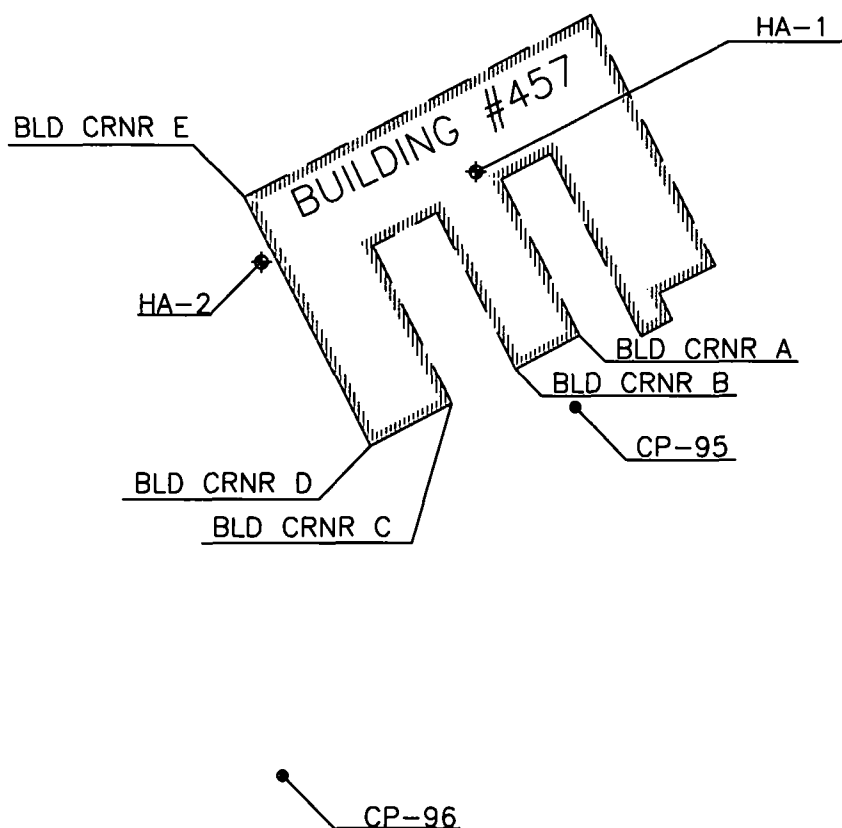
UJ = indicates the compound or analyte was analyzed for but was not detected. The sample detection limit is an estimated value.

ASTM = American Society of Testing and Materials

NA= not analyzed

SS = Soil Sample

Appendix C
Land Surveying Data



BUILDING #457 PRL AND NOTABLE FEATURES LOCATIONS			
STATION	NORTHING	EASTING	ELEVATION
BLD CRNR A	2188239.99	6114307.21	
BLD CRNR B	2188221.75	6114271.56	
BLD CRNR C	2188203.55	6114235.93	
BLD CRNR D	2188180.92	6114191.40	
BLD CRNR E	2188314.35	6114123.11	
CP 95	2188201.74	6114304.45	356.76
CP 96	2188003.78	6114142.36	352.96
BLD 457-HA 1	2188327.91	6114249.92	358.23
BLD 457-HA 2	2188279.51	6114132.01	352.77



DCA CIVIL
ENGINEERING
GROUP

17625 Crenshaw Blvd., Ste. 300
Torrance, California 90504
Tel: (310) 327-0018
Fax: (310) 327-0175
www.dcacivileng.com

POTENTIAL RELEASE LOCATION SKETCH
BUILDING #457

SCALE: 1"=100' DATE: 06-06-05

BY: JCL JOB NO.: 04-1058-2227.000-535

Attachment 6
Summary Report
PRL 634



Summary Report for PRL 634, Environmental Baseline Survey

FORMER MARINE CORPS AIR STATION EL TORO, CALIFORNIA

July 2008

Prepared for:

**Base Realignment and Closure
Program Management Office West
San Diego, California**

Prepared by:

**Earth Tech, Inc.
841 Bishop Street, Suite 500
Honolulu, HI 96813-3920**

Prepared under:

**Naval Facilities Engineering Command
Contract Number N62742-94-D-0048
Contract Task Order 0068
DCN: ET-0048-0068-0008**

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APPENDICES

A Drain Sampling Results	
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ACRONYMS AND ABBREVIATIONS

µg/kg	micrograms per kilogram
bgs	below ground surface
BNI	Bechtel National, Inc.
COPC	constituent of potential concern
EBS	environmental baseline survey
EPA	Environmental Protection Agency
EPC	exposure point concentration
HA	hand auger
HI	hazard index
ID	identification
J	indicates an estimated value
JS	jar sample
MCAS	Marine Corps Air Station
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NAVFAC SW	Naval Facilities Engineering Command Southwest
PCB	polychlorinated biphenyl
PRG	preliminary remediation goal
PRL	potential release location
SVOC	semivolatile organic compound
TAA	temporary accumulation area
TPH	total petroleum hydrocarbons
TPH _d	TPH as diesel
TPH _g	TPH as gasoline
TPH _m	TPH as motor oil
U	indicates the compound or analyte was analyzed for but was not detected at or above the stated limit
UJ	indicates the compound or analyte was analyzed for but was not detected; the sample detection limit is an estimated value
UST	underground storage tank
VOC	volatile organic compound

1. Background

Potential Release Location (PRL) 634 is associated with Building 634, situated in the northeast quadrant of former Marine Corps Air Station (MCAS) El Toro, California (Figure 1). The building was identified as a Maintenance Hanger; an Airframes Shop; and an Avionics Shop in 1973. Figure 2 shows the plan of Building 634 and the surrounding area.

The original floor plans for this facility outlined the areas for a variety of workshops. Those workshops where hazardous chemicals would have been used include Cleaning and Preservation, Decanning, Machine, Metal, Engine, Cleaning, Sand Blasting, X-Ray Room, and Plating Shop. A major renovation took place in the 1980s; however, the main activities continued.

Four locations of concern were associated with this site. PCB T85 and PCB T86 were transformers containing polychlorinated biphenyls (PCBs) that have been removed. The field survey conducted in 1994 indicated no evidence of a release, and no PCB releases were identified through the records search or the visual site inspections conducted in 2002 in support of the 2003 Environmental Baseline Survey (EBS) (Naval Facilities Engineering Command Southwest [NAVFAC SW] 2003). Therefore, no further action was recommended. TAA 634 is a less-than-90-day temporary accumulation area (TAA), which is currently inactive and currently under investigation. UST 634 was a 10,000-gallon, fuel-oil underground storage tank (UST) that has been removed and the site has been closed by the Orange County Health Care Agency in a letter dated 2 December 1996.

2. Issues and Concerns

The following issues and concerns associated with PRL 634 were identified during the records review, previous investigations, and visual site inspection conducted in 2002 in support of the 2003 EBS (NAVFAC SW 2003):

- Floor drains and service sinks were identified throughout the facility, as well as floor drains in the Cleaning and Plating Shop, and a Silver Recovery Unit in the X-Ray Processing and Control Room, which could have served as routes of release of hazardous chemicals used in the shops. Further investigation was recommended.

A sampling program was proposed to further investigate the issues identified and assess whether a release to the environment of hazardous substances or pollutants has occurred. A summary of soil sampling activities is presented in Section 3, and the results are presented in Section 4.

3. Sampling and Analysis Summary

Sampling to evaluate PRL 634 was conducted in January and March 2003. The sample locations are shown on Figure 2, and a sampling and analysis summary is provided in Table 1.

Seven soil samples were collected from seven boreholes (HA1, HA2, HA3, HA4, HA6, and HA7 at a depth range 1-foot to 2 feet below ground surface [bgs]; and HA5 at depth range of 0.5-1.5 feet bgs). The soil samples were collected using a hand auger (HA) and analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), and metals. The results for TPH are reported as TPH as gasoline (TPH_g), TPH as diesel (TPH_d), and TPH as motor oil (TPH_m).

In addition to evaluate constituents in the drain, a sediment sample was collected from the sink drain at location DS1, in the Non-Destructive Test Shop and analyzed for metals. The analytical results for

this sediment sample are presented in Appendix A, and in the EBS (NAVFAC SW 2003). The results were compared to Federal and State waste characterization thresholds. This data should be taken into consideration during the proposed removal of the residuals in the drains.

4. Investigation Results

This section presents analytical results and discusses the results of data evaluation and risk screening.

4.1 ANALYTICAL RESULTS AND QUALITY ASSURANCE

The analytical results for the samples collected at PRL 634 along with the United States Environmental Protection Agency (EPA) Region 9 or California-modified residential preliminary remediation goals (PRGs) (EPA 2004a) are presented in Table 2. Appendix B presents the validated laboratory analytical data and Appendix C presents the land surveying data.

Some results were qualified as estimated in the data validation process. These qualifications do not affect the findings or conclusions of this report.

4.2 RESULTS EVALUATION AND RISK SCREENING

TPH was detected in the soil samples collected from locations HA3, HA4, HA5, and HA6. The major contributor to the TPH detection was the diesel and motor oil fractions. However, the concentrations of TPH at these locations are not indicative of a significant release. Furthermore, the detections are assessed to be representative of the maximum concentrations in soil as the samples were collected adjacent to the nearest sources of release. No PRGs exist for TPH or its subcategories (i.e., TPH_g, TPH_d, and TPH_m).

None of the reported VOCs (acetone and methylene chloride) and SVOCs (bis(2-ethylexyl)phthalate and butylbenzylphthalate) exceeded its residential PRGs, and none of the metals (except arsenic and iron at location HA1) exceeded its respective residential PRGs. Although several metals concentrations exceeded the former MCAS El Toro background values (Bechtel National, Inc. [BNI] 1996) most of these exceedances were in the soil sample collected at location HA1. Arsenic was detected at a concentration of 7.8 milligrams per kilogram (mg/kg) at location HA1, which is greater than its California-modified residential PRG value of 0.06 mg/kg and former MCAS El Toro statistically derived background value of 6.86 mg/kg (which is based on the 95th quantile). However, it is within the range of arsenic concentrations used to derive the background (BNI 1996) and is less than the maximum reported concentration of 8.5 mg/kg. This data suggests that this value is within the expected range of arsenic concentrations at the Station. Iron was detected at a concentration of 32,100 mg/kg at location HA1, which is greater than the former MCAS El Toro background concentration of 18,400 mg/kg and the residential PRG of 23,463 mg/kg. However, iron is not identified as a constituent of potential concern (COPC) at this location and all other soil samples collected at a similar depth were consistent with background concentrations. Furthermore, the soil sample was collected next to a cast iron sewer pipe and may have contained remnants of the pipe material. Magnesium and potassium were detected at concentrations greater than the former MCAS El Toro background values at location HA1; no PRGs exist for these metals. Therefore, the metal analytical results from HA1 and in particular iron are assessed to be an anomaly. The other samples collected at this site were consistent with background indicating these elevated concentrations are localized at HA1 and are not indicative of a release.

Risk screening was performed to evaluate risks associated with potential exposures to detected analytes in the soil at PRL 634. The methodology for risk screening is presented in Section 3.3 of the main text of the Summary Report, and results are presented in Table 3.

The cumulative maximum carcinogenic risk due to potential exposure to maximum detected concentrations of COPCs (detected analytes) at PRL 634 is 1.3E-04, compared to the background risk of 1.1E-04. The maximum exposure point concentration (EPC) for arsenic of 7.8 mg/kg detected in the soil sample at location HA1 at 1-foot to 2 feet bgs, accounts for nearly 100 percent of the cancer risk.

The cumulative maximum noncancer hazard associated with potential exposure to maximum detected concentrations of COPCs, expressed as the hazard index (HI), is 3.3, which is consistent with the background HI of 2.5. The maximum EPCs for iron (32,100 mg/kg) and vanadium (63.2 mg/kg), detected in the soil sample at location HA1 at 1-foot to 2 feet bgs, account for about 42 percent and 25 percent of the noncancer HI, respectively. The iron concentration is greater than the former MCAS El Toro background concentration of 18,400 mg/kg and the PRG concentration of 23,463 mg/kg, which is based on a provisional reference dose. The vanadium concentration is less than the background concentration of 71.8 mg/kg and the PRG concentration of 78.21 mg/kg.

5. Conclusions and Recommendations

The primary objective of investigations conducted at PRL 634 was to assess whether a release of hazardous substances or pollutants into the environment has occurred. A review of available records, visual site inspections, and soil sampling analytical data indicates that a release of hazardous substances or pollutants has not occurred to the environment at PRL 634. The detected concentrations of all COPCs are not indicative of a release. The resulting cumulative cancer risk and the noncancer hazard at PRL 634 are consistent with the background cancer risk and background noncancer hazard, respectively. Therefore, no further investigation is recommended for PRL 634.

6. References

Aircraft Maintenance Shops (P-116), Floor Plan – West Portion, Drawing #: 1242404, May. 1962.

Bechtel National, Inc. (BNI 1996). *Final Technical Memorandum, Background and Reference Levels, Remedial Investigations, Marine Corps Air Station El Toro, California*. San Diego, CA: NAVFAC EFD SOUTHWEST.

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OHM/SWDIV. 1997. Aerial Survey.

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P436 Engine Maintenance Shop Modernization, Demolition Plan, New Construction Plan West Portion, Drawing # 6154554. February. 1981.

Naval Facilities Engineering Command Southwest (NAVFAC SW). 2003. *Final Environmental Baseline Survey, Former Marine Corps Air Station, El Toro, California*. San Diego, CA. September.

Tables

Table 1: Sampling and Analyses Summary – PRL 634

Analytical Group and Method ^a	Sample Location	HA3	HA2	HA1	HA7	HA6	HA6*	HA5	HA4	DS1
	EPA ID	LJ130	LJ131	LJ132	LJ133	LJ134	LJ135	LJ136	LJ170	LJ246
	Sample Depth (feet bgs)	1-2	1-2	1-2	1-2	1-2	1-2	0.5-1.5	1-2	NA
	Sampling Technique	HA	HA	HA	HA	HA	HA	HA	HA	JS
VOCs 8260B		X	X	X	X	X	X	X	X	—
SVOCs 8270C		X	X	X	X	X	X	X	X	—
TPH ^b 8015B		X	X	X	X	X	X	X	X	—
Metals 6010B and 7471A		X	X	X	X	X	X	X	X	X

Notes:

^a Analysis was in general accordance with the listed methods provided in EPA Publication SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.

^b Analytical results for TPH are reported as TPH as gasoline (TPH_g), TPH as diesel (TPH_d), and TPH as motor oil (TPH_m).

* Duplicate sample collected.

— = not analyzed

bgs = below ground surface

EPA = Environmental Protection Agency

HA = hand auger

ID = identification

JS = jar sample

PRL = potential release location

X = analysis was performed for the specified analyte

Table 2: Analytical Results Summary - PRL 634

Analyte	MCAS EI Toro Background Value (95th quantile) ^a	Residential Soil PRG ^b	Sample Location	PRL634-HA3	PRL634-HA2	PRL634-HA1	PRL634-HA7	PRL634-HA6	PRL634-HA6 (duplicate)	PRL634-HA5	PRL634-HA4
			Sample Depth	1.0-2.0 feet bgs	1.0-2.0 feet bgs	1.0-2.0 feet bgs	1.0-2.0 feet bgs	1.0-2.0 feet bgs	1.0-2.0 feet bgs	0.5-1.5 feet bgs	1.0-2.0 feet bgs
			EPA ID	LJ130	LJ131	LJ132	LJ133	LJ134	LJ135	LJ136	LJ170
Volatile Organic Compounds (µg/kg)											
Acetone	—	1.4E+07		95 UJ	25 J	130 UJ	33 J	98 UJ	34 J	110 UJ	34 J
Methylene Chloride	—	9.1E+03		0.7 J	4.8 U	2 J	4.9 U	2 J	5.1 U	5.3 U	4.6 U
Semivolatile Organic Compounds (µg/kg)											
Bis(2-ethylexy)phthalate	—	3.5E+04		550 U	520 U	690 U	540 U	540 U	540 U	550 U	35 J
Butylbenzylphthalate	—	1.2E+07		550 U	520 U	690 U	540 U	540 U	540 U	67 J	560 U
Metals (mg/kg)											
Aluminum	14,800	7.6E+04		7,120	3,930	28,800	7,320	7,280	12,800	4,810	10,200
Arsenic ^c	6.86	6.2E-02		3.2	1.9	7.8	2.6	2.9	3.6	6.1	2.8 UJ
Barium	173	5.4E+03		85.3	67.9	268	67.9	108	125	34.9	108
Beryllium	0.669	1.5E+02		0.88 U	0.83 U	0.46	0.87 U	0.86 U	0.86 U	0.17 UJ	0.9 U
Cadmium	2.35	3.7E+01		0.27 UJ	0.18 UJ	0.23 UJ	0.31 UJ	0.32 UJ	0.19 UJ	0.89 U	0.055 UJ
Calcium	46,000	—		4,850 J	3,950 J	17,300 J	4,770 J	5,410 J	8,470 J	918 J	7,060
Chromium	26.9	2.1E+02		7.5	4	21.4	9.4	7	11.3	6.2	12.1
Cobalt	6.98	9.0E+02		4.6	3.2	13.9	5.2	5.3	8.2	2.5	24.2
Copper	10.5	3.1E+03		4.3	3	14.2	5.7	4.2	5.1	3.7	9.6
Iron	18,400	2.3E+04		9,890	6,510	32,100	10,300	10,800	16,500	8,340	13,600
Lead ^d	15.1	1.5E+02		3.5	1.3	7.1	3.1	2	2.9	3.6	5.8
Magnesium	8,370	—		3,480	2,480	15,100	3,510	4,380	6,700	1,350	4,920
Manganese	291	1.8E+03		154	142	410	149	200	275	42.5	220 J
Mercury	0.22	2.3E+01		0.024	0.21 U	0.17	0.037	0.022	0.016	0.056	0.015
Nickel	15.3	1.6E+03		4.8	3.6	12.7	5.9	5.1	6.3	3.9	7.4 J
Potassium	4,890	—		2,010	1,450	7,610	1,910	3,200	4,190	811	2,850
Selenium	0.32	3.9E+02		1.3 U	1.2 U	1.6 U	0.69 UJ	1.3 U	1.3 U	1.3 U	1.4 U
Silver	0.539	3.9E+02		2.2 U	2.1 U	2.7 U	2.2 U	2.1 U	2.2 U	2.2 U	2.3 U
Sodium	405	—		440 UJ	420 UJ	550 UJ	440 UJ	430 UJ	430 UJ	68.6 UJ	204 UJ
Thallium	0.42	5.2E+00		1.8 U	1.7 U	2.2 U	1.7 U	1.7 U	1.7 U	1.8 U	1.8 U
Vanadium	71.8	7.8E+01		22.3	15.5	63.2	22.8	23.4	37	14.8	29.2
Zinc	77.9	2.3E+04		28.1	20	90.4	39	38	46.4	17.7	39.3
Total Petroleum Hydrocarbons (mg/kg)											
Motor Oil	—	—		6 J	10 U	14 U	11 U	11 U	11 U	65	13
Diesel Fuel	—	—		11 U	10 U	14 U	11 U	11 U	11 U	4 J	2 J
Gasoline	—	—		9.5 U	9.9 U	13 U	9.9 U	0.02 J	11 U	10 U	10 U
General Chemistry											
pH	—	—		8.58	9.16	8.71	8.81	8.76	9.51	7.65	9.23

Notes

Concentrations in **bold font** indicate values greater than the residential soil PRGs and the MCAS EI Toro background values

Concentrations in *italicized and underlined font* indicate values greater than the former MCAS EI Toro background values, but less than the residential soil PRGs

^a Source: BNI 1996

^b Analytical results were compared to EPA Region 9 PRGs (2004a), with the exception of arsenic and lead (see note c)

^c Analytical results for arsenic and lead were compared to California-modified PRGs (2004a) because they are significantly more protective than the corresponding EPA Region 9 PRGs

— = value does not exist

µg/kg= micrograms per kilogram

bgs = below ground surface

BNI = Bechtel National, Inc.

EPA = Environmental Protection Agency

ID = identification

J = indicates an estimated value

MCAS = Marine Corps Air Station

mg/kg= milligrams per kilogram

PRG = preliminary remediation goal

PRL = potential release location

U= indicates the compound or analyte was analyzed for but was not detected at or above the stated limit

UJ= indicates the compound or analyte was analyzed for but was not detected; the sample detection limit is an estimated value

Table 3: Risk Screening Results - PRL 634

COPC	Maximum EPC		Carcinogenic PRG ^b	Noncarcinogenic PRG ^b	Risk Corresponding to Maximum EPC				Risk Corresponding to Background			
		Carcinogenic			Noncarcinogenic		Carcinogenic		Noncarcinogenic			
		Excess Cancer Risk ^c			Percent Contribution to Cancer Risk ^d	HI ^e	Percent Contribution to Noncancer Risk ^d	Excess Cancer Risk ^f	Percent Contribution to Cancer Risk ^g	HI ^h	Percent Contribution to Noncancer Risk ^g	
Volatile Organic Compounds (µg/kg)												
Acetone	34	--	--	1.4E+07	--	--	2.4E-06	0.0%	--	--	--	--
Methylene Chloride	2	--	9.1E+03	2.0E+06	2.2E-10	0.0%	1.0E-06	0.0%	--	--	--	--
Semivolatile Organic Compounds (µg/kg)												
Bis(2-ethylexyl)phthalate	35	--	3.5E+04	1.2E+06	1.0E-09	0.0%	2.9E-05	0.0%	--	--	--	--
Butylbenzylphthalate	67	--	--	1.2E+07	--	--	5.5E-06	0.0%	--	--	--	--
Metals (mg/kg)												
Aluminum	28,800	14,800	--	7.6E+04	--	--	3.8E-01	11.0%	--	--	1.9E-01	7.6%
Arsenic ⁱ	7.8	6.86	6.2E-02	2.2E+01	1.3E-04	100%	3.6E-01	11.0%	1.1E-04	99.9%	3.2E-01	12.5%
Barium	268	173	--	5.4E+03	--	--	5.0E-02	1.5%	--	--	3.2E-02	1.3%
Berillium	0.46	0.669	--	--	--	--						
Calcium	17,300	46,000	--	--	--	--	--	--	--	--	--	--
Chromium	21.4	26.9	2.1E+02	--	1.0E-07	0%	--	--	1.3E-07	0.1%	--	--
Cobalt	24.2	6.98	9.0E+02	1.4E+03	2.7E-08	0%	1.8E-02	0.5%	7.7E-09	0.0%	5.1E-03	0.2%
Copper	14.2	10.5	--	3.1E+03	--	--	4.5E-03	0.1%	--	--	3.4E-03	0.1%
Iron	32,100	18,400	--	2.3E+04	--	--	1.4E+00	41.6%	--	--	7.8E-01	30.8%
Lead ⁱ	7.1	15.1	--	1.5E+02	--	--	4.7E-02	1.4%	--	--	1.0E-01	4.0%
Magnesium	15,100	8,370	--	--	--	--	--	--	--	--	--	--
Manganese	410	291	--	1.8E+03	--	--	2.3E-01	7.1%	--	--	1.7E-01	6.5%
Mercury	0.17	0.22	--	2.3E+01	--	--	7.2E-03	0.2%	--	--	9.4E-03	0.4%
Nickel	12.7	15.3	--	1.6E+03	--	--	8.1E-03	0.2%	--	--	9.8E-03	0.4%
Potassium	7,610	4,890	--	--	--	--	--	--	--	--	--	--
Vanadium	63.2	71.8	--	7.8E+01	--	--	8.1E-01	24.6%	--	--	9.2E-01	36.1%
Zinc	90.4	77.9	--	2.3E+04	--	--	3.9E-03	0.1%	--	--	3.3E-03	0.1%
Cumulative Maximum Risk					1.3E-04		3.3E+00		1.1E-04		2.5E+00	

Notes:

^a Source: BNI 1996

^b U.S. EPA Region 9 PRGs (2004a)

^c Excess cancer risk = 1E-06 x (Maximum EPC/Carcinogenic PRG)

^d With respect to cumulative excess cancer risk or hazard index

^e HI = Maximum EPC / Noncarcinogenic PRG

^f Excess cancer risk = 1E-06 x (MCAS El Toro Background or Anthropogenic Concentration/Carcinogenic PRG)

^g With respect to cumulative excess cancer risk or hazard index

^h HI = MCAS El Toro Background or Anthropogenic Concentration / Noncarcinogenic PRG

ⁱ = Analytical results for arsenic and lead were compared to California-modified PRGs (2004a) because they are significantly more protective than the corresponding EPA Region 9 PRGs

-- = value does not exist

µg/kg= micrograms per kilogram

BNI = Bechtel National, Inc.

COPC = constituent of potential concern

EPA = Environmental Protection Agency

EPC = exposure point concentration

HI = hazard index

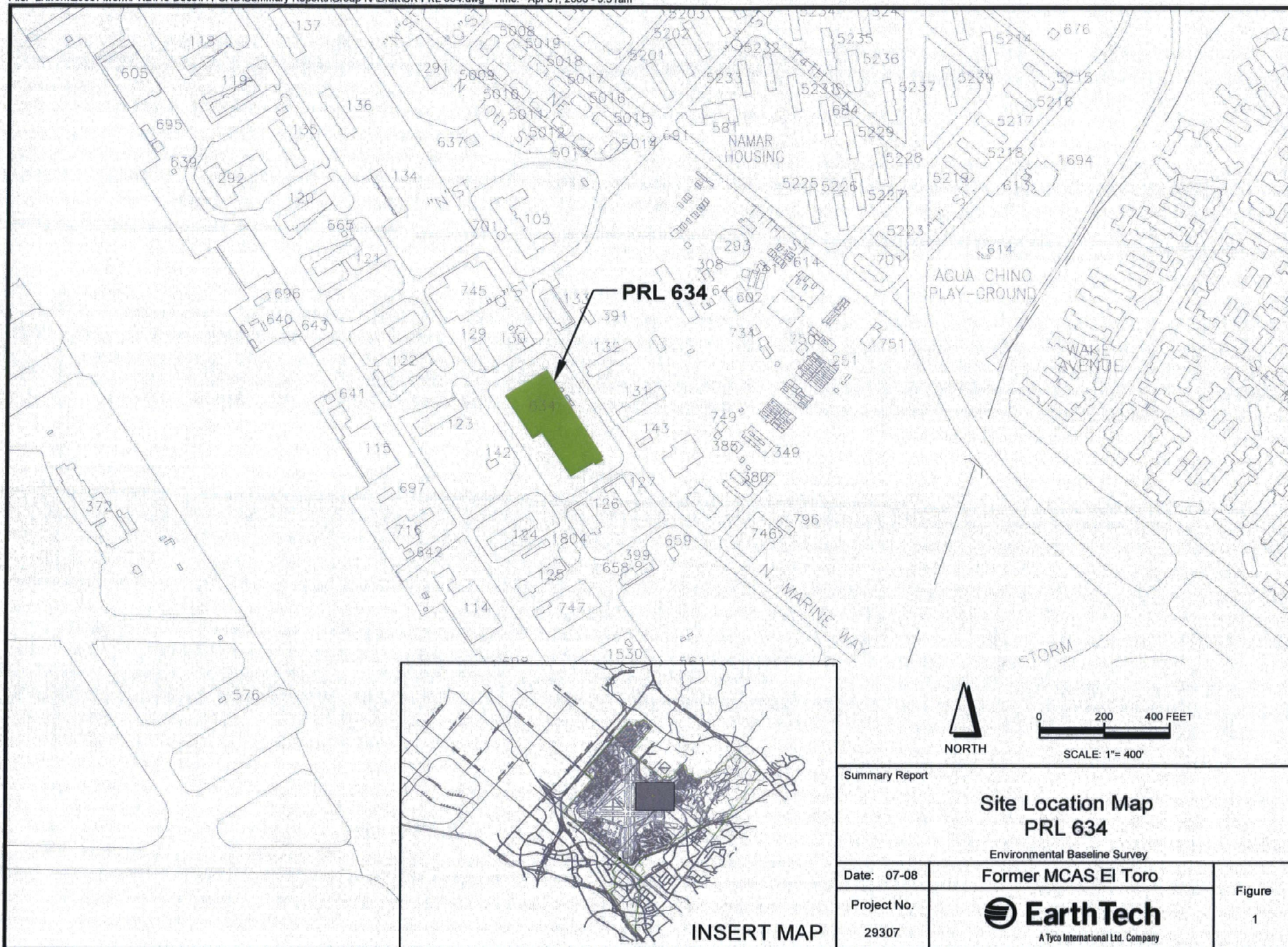
MCAS = Marine Corps Air Station

mg/kg = milligrams per kilogram

PRG = preliminary remediation goal

PRL = potential release location

Figures

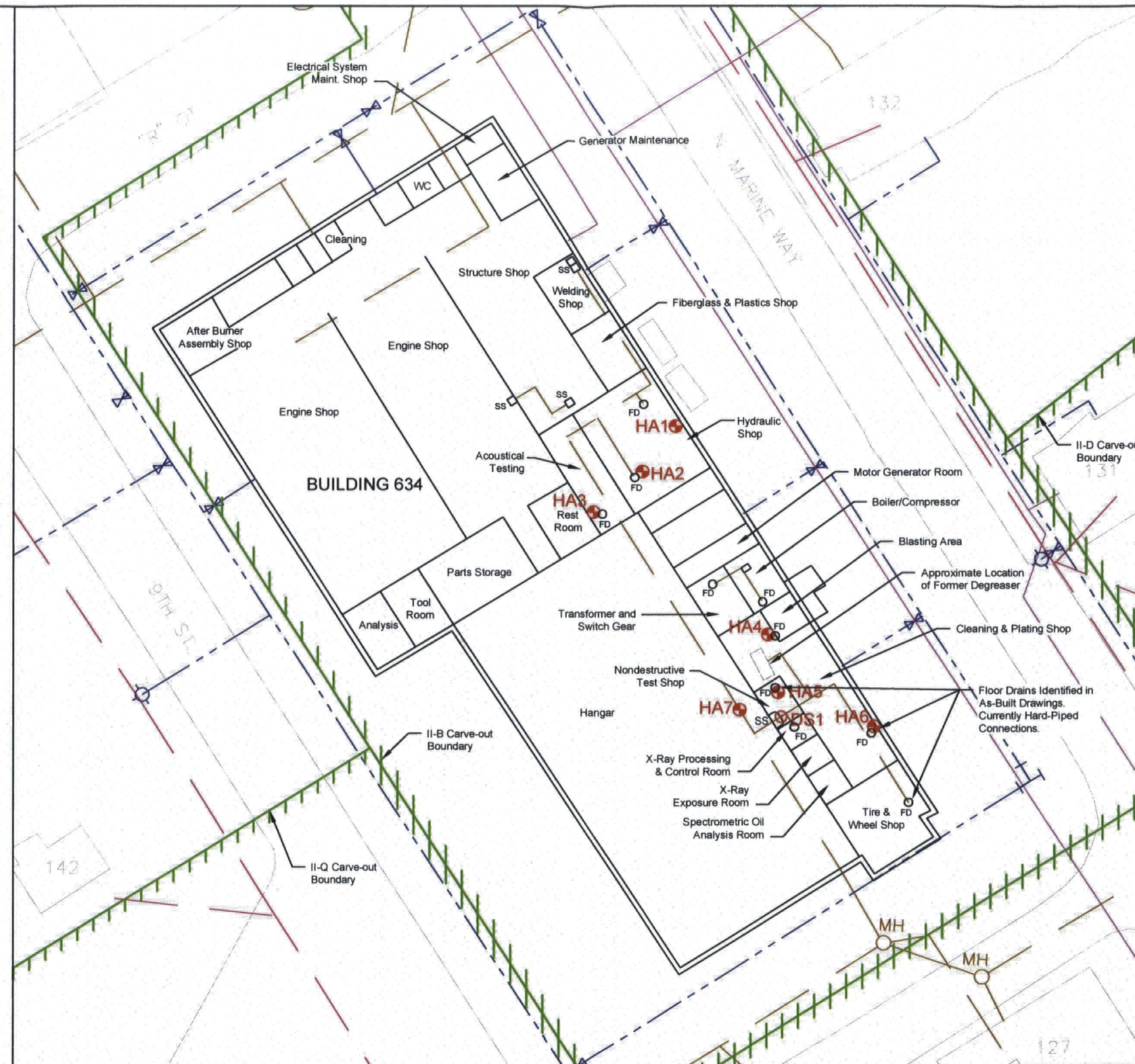




Hanger of Building 634
(Facing North)

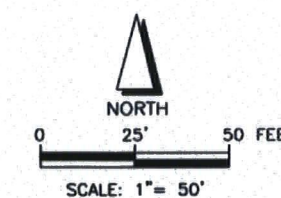


Hazmat Storage Area East Side of Building
(Facing North)



LEGEND:

- Sanitary Sewer
- Water Line
- Electrical Line
- Natural Gas Line
- Carve-out Boundary
- SS Sink
- FD Floor Drain
- WC Restroom
- MH Manhole
- Fire Hydrant
- Water Valve
- DS1 Drain Sample Location (Earth Tech, 2003)
(Analytes: Metals)
- HA1 Soil Sample Location (Earth Tech, 2003)
(Sample Depth: 0.5 to 2 ft bgs;
Analytes: VOCs, SVOCs, TPH, and Metals)



Note: Features and interior layout are approximate and may not be to scale

Summary Report

Site Plan PRL 634

Environmental Baseline Survey

Date: 07-08

Former MCAS El Toro

Project No.

29307

EarthTech
A Tyco International Ltd. Company

Figure

2

Appendix A
Drain Sampling Results

Table A-1: Analytical Results and Preliminary Waste Characterization, Sink Drain Samples (Solid Matrix), PRL 634

Analyte	RCRA Hazardous Waste		California Hazardous Waste			Sample Location	PRL-634-DS1
	TCLP ^a	20 x TCLP ^b	TTLC ^c	STLC ^d	10 x STLC ^e	Sample Type	Water Closet Drain
	(mg/L)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	EPA ID	LJ246 (mg/kg)
Metals (mg/kg)							
Aluminum	--	--	--	--	--		1,710
Antimony	--	--	500	15	150		30 U
Arsenic	5	100	500	5	50		4.1
Barium	100	2,000	10,000	100	1,000		93.8
Berillium	--	--	75	0.8	7.5		0.12 UJ
Cadmium	1	20	100	1	10		291
Calcium	--	--	--	--	--		24,600
Chromium	5	100	2,500	5	50		251
Cobalt	--	--	8,000	80	800		4.8 UJ
Copper	--	--	2,500	25	250		50,100
Iron	--	--	--	--	--		84,700
Lead	5	100	1,000	5	50		1,530
Magnesium	--	--	--	--	--		19,800
Manganese	--	--	--	--	--		239
Mercury	0.2	4	20	0.2	2		0.38
Nickel	--	--	2,000	20	200		154
Potassium	--	--	--	--	--		2,690
Selenium	1	20	100	1	10		1.2
Silver	5	100	500	5	50		184
Sodium	--	--	--	--	--		4,430
Thallium	--	--	700	7	70		1.2
Vanadium	--	--	2,400	24	240		1.5 UJ
Zinc	--	--	5,000	250	2,500		55,100

Notes:

Concentrations in **bold font** indicate concentrations, greater than their respective TTLCs, thereby classifying the material as California-regulated, non-RCRA hazardous waste. These concentrations also exceeded 20 times TCLP values, or 10 times STLCs.

Concentrations in *italicized and underlined font* indicate values greater than 20 times TCLP and 10 times STLC.

^a Maximum concentration (mg/L) of contaminants for the toxicity characteristic determined by the Toxicity Characteristic Leaching Procedure.

^b Correction factor for estimating whether the concentration in a solid may exceed the TCLP value.

^c Total threshold limit concentration (mg/kg) (California Code of Regulations Title 22).

^d Soluble Threshold Limit Concentration in milligrams per liter of waste extract determined using the Waste Extraction test (California Code of Regulations Title 22).

^e Correction factor for estimating whether the concentration in a solid may exceed the STLC.

-- = value does not exist

EPA = Environmental Protection Agency

ID = identification

mg/kg = milligrams per kilogram

mg/L = milligrams per liter

PRL = potential release location

RCRA = Resource Conservation and Recovery Act

STLC = soluble threshold limit concentration

TCLP = toxicity characteristic leaching procedure

U= indicates the compound or analyte was analyzed for but was not detected at or above the stated limit

UJ= indicates the compound or analyte was analyzed for but was not detected; the sample detection limit is an estimated value

Appendix B
Validated Laboratory Analytical Data Reports

Validated Analytical Data for PRL 634

		EPA ID:	LJ130	LJ131	LJ132	LJ133	LJ134	LJ135	LJ136	LJ170	LJ246
		Location ID:	PRL634-HA3	PRL634-HA2	PRL634-HA1	PRL634-HA7	PRL634-HA6	PRL634-HA6 (dup)	PRL634-HA5	PRL634-HA4	PRL634-DS1
		Sample Type:	SS	SS	SS	SS	SS	SS	SS	SS	DS
		Sample Depth (feet bgs)	1.0-2.0	1.0-2.0	1.0-2.0	1.0-2.0	1.0-2.0	1.0-2.0	0.5-1.5	1.0-2.0	NA
		Sample Date:	24-Jan-03	24-Jan-03	24-Jan-03	24-Jan-03	24-Jan-03	24-Jan-03	24-Jan-03	24-Jan-03	05-Mar-03
Parameter	Units	Analytical Method ¹									
Volatile Organic Compounds											
1,1,1,2-Tetrachloroethane	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
1,1,1-Trichloroethane	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
1,1,2,2-Tetrachloroethane	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
1,1,2-Trichloroethane	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
1,1,2-Trichlorotrifluoroethane	ug/kg	8260B	4.8 UJ	4.8 UJ	6.7 UJ	4.9 UJ	4.9 UJ	5.1 UJ	5.3 UJ	4.6 UJ	--
1,1-Dichloroethane	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
1,1-Dichloroethene	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
1,2-Dichloroethane	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
1,2-Dichloropropane	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
1,2-Dichlorotetrafluoroethane	ug/kg	8260B	4.8 UJ	4.8 UJ	6.7 UJ	4.9 UJ	4.9 UJ	5.1 UJ	5.3 UJ	4.6 UJ	--
2-Butanone	ug/kg	8260B	95 U	96 U	130 U	98 U	98 U	100 U	110 U	92 U	--
2-Hexanone	ug/kg	8260B	48 UJ	48 UJ	67 UJ	49 UJ	49 UJ	51 UJ	53 UJ	46 UJ	--
4-Methyl-2-pentanone	ug/kg	8260B	48 UJ	48 UJ	67 UJ	49 UJ	49 UJ	51 UJ	53 UJ	46 UJ	--
Acetone	ug/kg	8260B	95 UJ	25 J	130 UJ	33 J	98 UJ	34 J	110 UJ	34 J	--
Benzene	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
Bromodichloromethane	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
Bromoform	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
Bromomethane	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
Carbon Disulfide	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
Carbon Tetrachloride	ug/kg	8260B	4.8 UJ	4.8 UJ	6.7 UJ	4.9 UJ	4.9 UJ	5.1 UJ	5.3 UJ	4.6 UJ	--
Chlorobenzene	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
Chloroethane	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
Chloroform	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
Chloromethane	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
cis-1,2-Dichloroethene	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
cis-1,3-Dichloropropene	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
Dibromochloromethane	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
Dichlorodifluoromethane (Freon-12)	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
Di-isopropyl Ether (DIPE)	ug/kg	8260B	4.8 UJ	4.8 UJ	6.7 UJ	4.9 UJ	4.9 UJ	5.1 UJ	5.3 UJ	4.6 UJ	--
Ethyl tertiary butyl ether	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
Ethylbenzene	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
Methylene Chloride	ug/kg	8260B	0.7 J	4.8 U	2 J	4.9 U	2 J	5.1 U	5.3 U	4.6 U	--
Methyl-tert butyl ether (MTBE)	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
Styrene	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
Tertiary amyl methyl ether	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
Tertiary Butyl Alcohol	ug/kg	8260B	19 UJ	19 UJ	27 UJ	20 UJ	20 UJ	20 UJ	21 UJ	18 UJ	--
Tetrachloroethene (PCE)	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
Toluene	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
Total Xylenes	ug/kg	8260B	14 UJ	14 UJ	20 UJ	15 UJ	15 UJ	15 UJ	16 UJ	14 U	--
Trans-1,2-Dichloroethene	ug/kg	8260B	4.8 UJ	4.8 UJ	6.7 UJ	4.9 UJ	4.9 UJ	5.1 UJ	5.3 UJ	4.6 UJ	--
Trans-1,3-Dichloropropene	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
Trichloroethene (TCE)	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
Trichlorofluoromethane (Freon-11)	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--

		EPA ID:	LJ130	LJ131	LJ132	LJ133	LJ134	LJ135	LJ136	LJ170	LJ246
		Location ID:	PRL634-HA3	PRL634-HA2	PRL634-HA1	PRL634-HA7	PRL634-HA6	PRL634-HA6 (dup)	PRL634-HA5	PRL634-HA4	PRL634-DS1
		Sample Type:	SS	SS	SS	SS	SS	SS	SS	SS	DS
		Sample Depth (feet bgs)	1.0-2.0	1.0-2.0	1.0-2.0	1.0-2.0	1.0-2.0	1.0-2.0	0.5-1.5	1.0-2.0	NA
		Sample Date:	24-Jan-03	24-Jan-03	24-Jan-03	24-Jan-03	24-Jan-03	24-Jan-03	24-Jan-03	24-Jan-03	05-Mar-03
Parameter	Units	Analytical Method ¹									
Vinyl Chloride	ug/kg	8260B	4.8 U	4.8 U	6.7 U	4.9 U	4.9 U	5.1 U	5.3 U	4.6 U	--
Semi-Volatile Organic Compounds											
1,2,4-Trichlorobenzene	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
1,2-Dichlorobenzene	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
1,3-Dichlorobenzene	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
1,4-Dichlorobenzene	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
2,2'-Oxybis(1-chloropropane)	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
2,4,5-Trichlorophenol	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
2,4,6-Trichlorophenol	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
2,4-Dichlorophenol	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
2,4-Dimethylphenol	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 UJ	--
2,4-Dinitrophenol	ug/kg	8270C	2700 U	2600 UJ	3400 UJ	2700 UJ	2700 UJ	2700 UJ	2800 U	2800 U	--
2,4-Dinitrotoluene	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
2,6-Dinitrotoluene	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
2-Chloronaphthalene	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
2-Chlorophenol	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
2-Methylphenol	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
2-Nitroaniline	ug/kg	8270C	2700 U	2600 U	3400 U	2700 U	2700 U	2700 U	2800 U	2800 U	--
2-Nitrophenol	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
3,3'-Dichlorobenzidine	ug/kg	8270C	1100 U	1000 U	1400 U	1100 U	1100 U	1100 U	1100 U	1100 U	--
3/4-methylphenol	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
3-Nitroaniline	ug/kg	8270C	2700 U	2600 U	3400 U	2700 U	2700 U	2700 U	2800 U	2800 U	--
4,6-Dinitro-2-methylphenol	ug/kg	8270C	2700 U	2600 U	3400 U	2700 U	2700 UJ	2700 U	2800 U	2800 U	--
4-Bromophenyl-phenylether	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
4-Chloro-3-Methylphenol	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
4-Chloroaniline	ug/kg	8270C	1100 U	1000 U	1400 U	1100 U	1100 U	1100 U	1100 U	1100 U	--
4-Chlorophenyl-phenyl ether	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
4-Nitroaniline	ug/kg	8270C	2700 U	2600 U	3400 U	2700 U	2700 U	2700 U	2800 U	2800 U	--
4-Nitrophenol	ug/kg	8270C	2700 U	2600 U	3400 U	2700 U	2700 U	2700 U	2800 U	2800 U	--
bis(2-chlorethoxy)methane	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
bis(2-chloroethyl)ether	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
bis(2-ethylhexyl)phthalate	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	35 J	--
Butylbenzylphthalate	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	67 J	560 U	--
Carbazole	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
Dibenzofuran	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
Diethylphthalate	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
Dimethylphthalate	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
Di-n-butylphthalate	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
Di-n-octylphthalate	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
Hexachlorobenzene	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
Hexachlorobutadiene	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
Hexachlorocyclopentadiene	ug/kg	8270C	2700 U	2600 U	3400 U	2700 U	2700 U	2700 U	2800 U	2800 U	--
Hexachloroethane	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
Isophorone	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
Nitrobenzene	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--

		EPA ID:	LJ130	LJ131	LJ132	LJ133	LJ134	LJ135	LJ136	LJ170	LJ246
		Location ID:	PRL634-HA3	PRL634-HA2	PRL634-HA1	PRL634-HA7	PRL634-HA6	PRL634-HA6 (dup)	PRL634-HA5	PRL634-HA4	PRL634-DS1
		Sample Type:	SS	SS	SS	SS	SS	SS	SS	SS	DS
		Sample Depth (feet bgs)	1.0-2.0	1.0-2.0	1.0-2.0	1.0-2.0	1.0-2.0	1.0-2.0	0.5-1.5	1.0-2.0	NA
		Sample Date:	24-Jan-03	24-Jan-03	24-Jan-03	24-Jan-03	24-Jan-03	24-Jan-03	24-Jan-03	24-Jan-03	05-Mar-03
Parameter	Units	Analytical Method ¹									
n-Nitrosodi-n-propylamine	ug/kg	8270C	550 U	520 UJ	690 UJ	540 U	540 U	540 U	550 U	560 U	--
n-Nitroso-diphenylamine	ug/kg	8270C	2700 U	2600 U	3400 U	2700 U	2700 U	2700 U	2800 U	2800 U	--
Pentachlorophenol	ug/kg	8270C	1900 U	1800 U	2300 U	1900 U	1800 U	1800 U	1900 U	1900 U	--
Phenol	ug/kg	8270C	550 U	520 U	690 U	540 U	540 U	540 U	550 U	560 U	--
Metals											
Aluminum	mg/kg	6010B	7120	3930	28800	7320	7280	12800	4810	10200	1710
Antimony	mg/kg	6010B	13 U	12 U	16 U	13 U	13 U	13 U	0.78 UJ	14 U	30 U
Arsenic	mg/kg	6010B	3.2	1.9	7.8	2.6	2.9	3.6	6.1	2.8 UJ	4.1
Barium	mg/kg	6010B	85.3	67.9	268	67.9	108	125	34.9	108	93.8
Berillium	mg/kg	6010B	0.88 U	0.83 U	0.46	0.87 U	0.86 U	0.86 U	0.17 UJ	0.9 U	0.12 UJ
Cadmium	mg/kg	6010B	0.27 UJ	0.18 UJ	0.23 UJ	0.31 UJ	0.32 UJ	0.19 UJ	0.89 U	0.055 UJ	291
Calcium	mg/kg	6010B	4850 J	3950 J	17300 J	4770 J	5410 J	8470 J	918 J	7060	24600
Chromium	mg/kg	6010B	7.5	4	21.4	9.4	7	11.3	6.2	12.1	251
Cobalt	mg/kg	6010B	4.6	3.2	13.9	5.2	5.3	8.2	2.5	24.2	4.8 UJ
Copper	mg/kg	6010B	4.3	3	14.2	5.7	4.2	5.1	3.7	9.6	50100
Iron	mg/kg	6010B	9890	6510	32100	10300	10800	16500	8340	13600	84700
Lead	mg/kg	6010B	3.5	1.3	7.1	3.1	2	2.9	3.6	5.8	1530
Magnesium	mg/kg	6010B	3480	2480	15100	3510	4380	6700	1350	4920	19800
Manganese	mg/kg	6010B	154	142	410	149	200	275	42.5	220 J	239
Mercury	mg/kg	7471A	0.024	0.21 U	0.17	0.037	0.022	0.016	0.056	0.015	0.38
Nickel	mg/kg	6010B	4.8	3.6	12.7	5.9	5.1	6.3	3.9	7.4 J	154
Potassium	mg/kg	6010B	2010	1450	7610	1910	3200	4190	811	2850	2690
Selenium	mg/kg	6010B	1.3 U	1.2 U	1.6 U	0.69 UJ	1.3 U	1.3 U	1.3 U	1.4 U	1.2
Silver	mg/kg	6010B	2.2 U	2.1 U	2.7 U	2.2 U	2.1 U	2.2 U	2.2 U	2.3 U	184
Sodium	mg/kg	6010B	440 UJ	420 UJ	550 UJ	440 UJ	430 UJ	430 UJ	68.6 UJ	204 UJ	4430
Thallium	mg/kg	6010B	1.8 U	1.7 U	2.2 U	1.7 U	1.7 U	1.7 U	1.8 U	1.8 U	1.2
Vanadium	mg/kg	6010B	22.3	15.5	63.2	22.8	23.4	37	14.8	29.2	1.5 UJ
Zinc	mg/kg	6010B	28.1	20	90.4	39	38	46.4	17.7	39.3	55100
Total Petroleum Hydrocarbons (mg/kg)											
Motor Oil	mg/kg	8015B DRO	6 J	10 U	14 U	11 U	11 U	11 U	65	13	--
Diesel Fuel	mg/kg	8015B DRO	11 U	10 U	14 U	11 U	11 U	11 U	4 J	2 J	--
Gasoline	mg/kg	8015B GRO	9.5 U	9.9 U	13 U	9.9 U	0.02 J	11 U	10 U	10 U	--
General Chemistry											
pH	pH	9045C	8.58	9.16	8.71	8.81	8.76	9.51	7.65	9.23	--

Notes:

¹ = Environmental Protection Agency Method unless otherwise noted.

U = indicates the compound or analyte was analyzed for but was not detected at or above the stated limit.

J = indicates an estimated value

UJ = indicates the compound or analyte was analyzed for but was not detected. The sample detection limit is an estimated value.

-- = not analyzed

NA= not applicable

ASTM = American Society of Testing and Materials

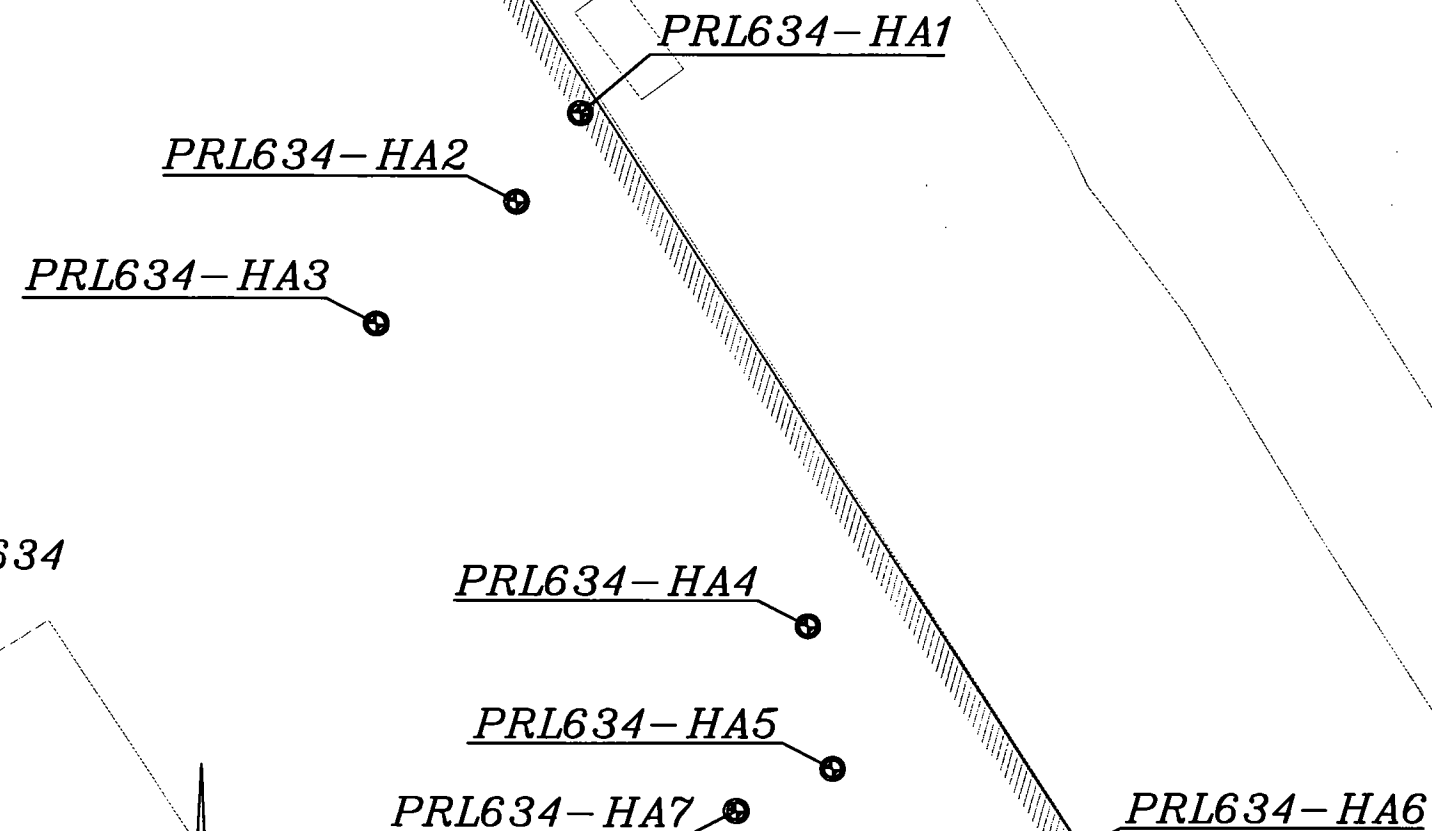
DS= drain sample

SS = Soil Sample




















Appendix C
Land Surveying Data

PROJECT MCAS EL TORO PRL 634
ELTORO MARINE BASE EL TORO, CA

BORE HOLES				
POINT NUMBER	DESCRIPTION	NORTH	EAST	ELEVATION
255	PRL634-HA1	2193198.88	6114776.86	404.20
254	PRL634-HA2	2193184.55	6114768.87	404.21
253	PRL634-HA3	2193164.78	6114744.72	404.20
256	PRL634-HA4	2193115.87	6114812.82	404.17
258	PRL634-HA5	2193092.73	6114816.79	404.27
259	PRL634-HA6	2193079.15	6114854.21	404.18
257	PRL634-HA7	2193085.90	6114801.60	404.09



Legend

AC	ASPHALT PAVING		MONITORING WELL
CB	BORE HOLE		SPARGE POINT
BLH	CHAIN LINK FENCE		VAPOR EXTRACTION WELLS
EMB	ELECTRIC BOX		VAPOR EXTRACTION VALVES
EZ	ELECTRIC MAN HOLE		BORE HOLE
EV	ELECTRIC VAULT		TOP OF RIM
FS	FINISH SURFACE		TOP OF CASING
FR	FIRE RISER		TOP OF CURB
GM	GAS METER		FLOW LINE
GV	GAS VAULT		RAILROAD TRACKS
PHV	PHONE VAULT		PARKING LOT LIGHT
SCO	SEWER CLEAN OUT		WOOD FENCE
SD	STORM DRAIN		CHAIN LINK FENCE
TMH	TELEPHONE VAULT		CATCH BASIN
TJH	TELEPHONE MAN HOLE		LANDSCAPE TREE
TOW	TOP OF WALL		CENTER LINE
TUB	UTILITY BOX		PROPERTY LINE
VLT	VAULT		FIRE HYDRANT
WAB	WATER BOX		LIGHT
WAM	WATER METER		
WVS	WATER VALVES		

DATE OF SURVEY
FEBRUARY 10, 2003

BENCH MARK

THE ELEVATIONS SHOWN HEREON ARE BASED UPON ORANGE
COUNTY SURVEYORS MONUMENT NO.: 3E-113-90 ELEVATION =
413.237 FEET (NAVD88)

COORDINATES

THE COORDINATES SHOWN HEREON ARE BASED UPON THE STATE PLANE COORDINATE SYSTEM (NAD83), CALIFORNIA ZONE VI.

GRAPHIC SCALE



**PREPARED FOR
EARTH TECH**

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SHEET 19 OF 21